YAMAHA

Outboards

106 pages

T9.9X/F9.9X

OWNER'S MANUAL

READ THIS MANUAL CAREFULLY

U.S.A. Edition

YAMAHA MOTOR CORPORATION, U.S.A.

LIT-18626-03-30 ●

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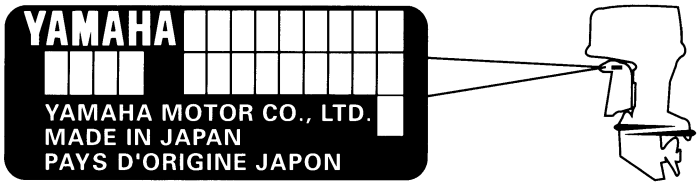
YAMAHA

OUTBOARD MOTOR WARRANTY REGISTRATION
ENREGISTREMENT DE LA GARANTIE DU MOTEUR HORS-BORD

Please complete and mail this card. This information is necessary to accurately register your unit for warranty.
Veuillez signer ci-dessous pour attester que le montage et l'inspection ont été faits dans le respect des directives d'inspection et que la marche à suivre pour la garantie et l'entretien a été expliquée à l'acheteur au détail.

OUTBOARD MOTOR MODEL AND SERIAL NUMBER (From I.D. label on clamp bracket)
MODÈLE ET NO. DE SÉRIE DU MOTEUR HORS-BORD (sur l'étiquette d'identification de la presse de fixation)



(For Dealer Use Only)
(A l'usage du concessionnaire)
YAMAHA DEALER NUMBER
NO. DU CONCESSIONNAIRE YAMAHA

DEALER NAME
NOM DU CONCESSIONNAIRE

DATE SOLD
DATE DE LIVRAISON
MONTH / MOIS ____ DAY / JOUR ____ YEAR / ANNÉE ____

USAGE (Check One) / UTILISATION (En cocher un.)
☐ PLEASURE / LOISIR
☐ COMMERCIAL / COMMERCIAL

OWNER'S NAME
NOM DU PROPRIÉTAIRE
FIRST / PRÉNOM _____ LAST / NOM DE FAMILLE _____

ADDRESS
ADRESSE
STREET / RUE _____

CITY / VILLE _____ STATE/PROVINCE / PROVINCE _____ ZIP / CODE POSTAL _____

PHONE NUMBER ( )
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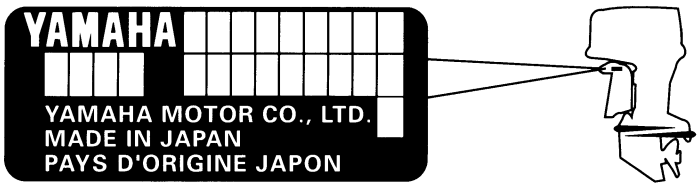

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EMA20000

TO THE OWNER

Thank you for choosing a Yamaha outboard motor. This Owner's manual contains information needed for proper operation, maintenance and care. A thorough understanding of these simple instructions will help you obtain maximum enjoyment from your new Yamaha.
If you have any question about the operation or maintenance of your outboard motor, please consult a Yamaha dealer.

In this Owner's Manual particularly important information is distinguished in the following ways.

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠WARNING

Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the outboard motor.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the outboard motor.

NOTE:

A NOTE provides key information to make procedures easier or clearer.

* Yamaha continually seeks advancements in product design and quality. Therefore, while this manual contains the most current product information available at the time of printing, there may be minor discrepancies between your machine and this manual. If there is any question concerning this manual, please consult your Yamaha dealer.

Yamaha Motor Co., Ltd.

EMA10000

T9.9X/F9.9X
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1st Edition, April 1998
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Printed in Japan
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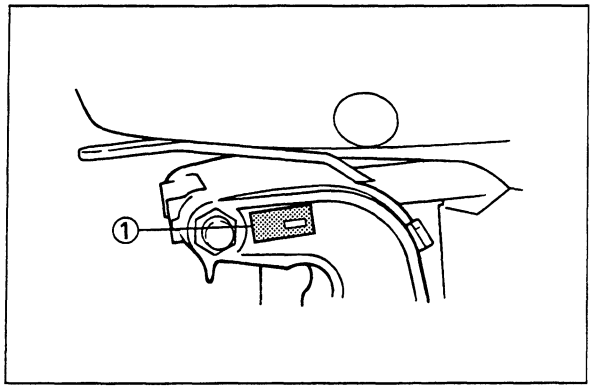
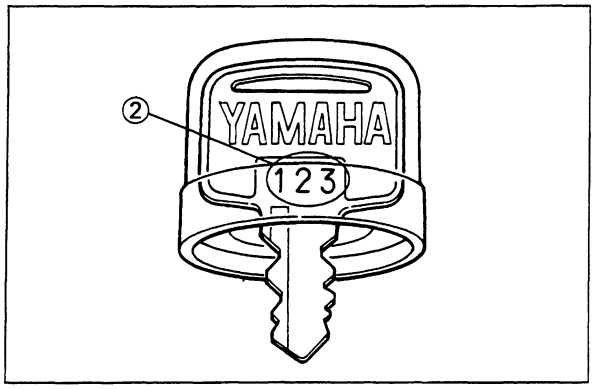




EMB10011

IDENTIFICATION NUMBERS RECORD

EMB10210

OUTBOARD MOTOR SERIAL NUMBER

The outboard motor serial number is stamped on the label attached to the port side of the clamp-bracket.
Record your outboard motor serial number in the spaces provided to assist you in ordering spare parts from your Yamaha dealer or for reference in case your outboard motor is stolen.

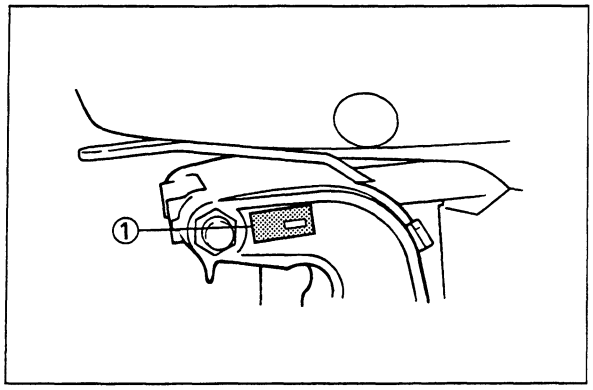
① Outboard motor serial number

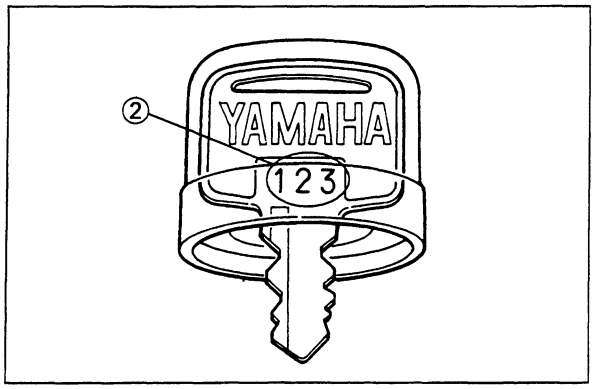
EMB10310

KEY NUMBER

If main key switch is equipped, your key identification number is stamped on your key as shown in the illustration. Record this number in the space provided for reference if you need a new key.

② Key number





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EMA40001

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IMPORTANT WARRANTY INFORMATION FOR U.S.A. AND CANADA

Welcome to the Yamaha Family!

Congratulations on the purchase of your new Yamaha marine power. Yamaha is committed to exceptional customer satisfaction, and we want your ownership experience to be a satisfying one. Please read the following warranty information to help ensure satisfaction with your Yamaha.

Yamaha is ready to stand behind your purchase with strong warranty coverage. To be sure you receive all the benefits of warranty, please take the following steps:

1. Be sure your new Yamaha is registered for warranty. Your boat dealer should do this at the time of sale. Make sure your dealer gives you a copy of the completed Yamaha registration card for your records. If you are unsure whether or not your Yamaha is registered, complete the Warranty Registration card found inside the front cover of the Owner's Manual. Mail it to the distributor for the country in which you live (see step 6 for the correct address). If your Yamaha is not properly registered, a warranty repair could be unnecessarily delayed while registration records are checked.
2. Read the Limited Warranty statement which follows these instructions. This warranty applies to Yamaha outboard motors sold in the United States, whether purchased separately or when supplied as original equipment by a boat builder. The terms also apply to original equipment packages sold in Canada, with coverage provided by Yamaha Motor Canada (see "Warranty Guide" for Canadian models). This warranty explains the conditions of the warranty, including the obligations that your dealer and you as the owner have under the warranty. For example, your Yamaha outboard must receive a proper predelivery inspection (PDI) by the selling dealer. Failure to take this important step could jeopardize warranty coverage!

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3. If you need warranty repairs, you must take your Yamaha outboard to an authorized Yamaha outboard dealer. Be aware that not all selling boat dealers are authorized Yamaha dealers. Only authorized dealers have the factory training, special tools, and Yamaha support needed to perform warranty repairs.

4. If you are away from home, or your selling dealer is not an authorized Yamaha dealer, use the following toll-free numbers to find the nearest Yamaha dealer.

   United States Dealer Locations: 1-800-447-4700
   Canada Dealer Locations: 1-800-267-8577

5. Your warranty applies specifically to repairs made in the country of purchase. If your U.S.-purchased Yamaha needs warranty service while in Canada, or your Canadian purchased Yamaha needs service while in the United States, Yamaha will assist the local dealer whenever possible. However, some products available in one country may not be sold or serviced in the other.

6. If you need any additional information about your Yamaha or warranty coverage which your dealer cannot provide, please contact us directly.

   Yamaha Motor Corporation, U.S.A.
   P.O. Box 6555
   Cypress, CA 90630
   Attention: Customer Relations Department

   Telephone No. (714) 761-7439
   Fax No. (714) 761-7559

   Yamaha Motor Canada Ltd.
   480 Gordon Baker Road
   North York, Ontario
   M2H 3B4
   Attention: Customer Relations Department

   Telephone No. (416) 498-1911
   Fax No. (416) 491-3122

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OUTBOARD MOTOR TWO YEAR LIMITED WARRANTY

Yamaha Motor Corporation, U.S.A. is proud of its heritage and reputation for producing products with high standards of quality and workmanship. Product excellence provides the cornerstone for our commitment to customer satisfaction. The Yamaha Outboard Limited Warranty is your assurance of this commitment.

This warranty provides you with protection against the expense of repairs for your outboard motor that are required as a result of defects in materials or workmanship. When maintained and utilized in the prescribed manner, you can count on your Yamaha outboard to provide reliable service.

This warranty provides you with specific coverage and notes your responsibilities in maintaining and operating your outboard. Please take the time to read and become familiar with this warranty.

PERIOD OF WARRANTY. Any new Yamaha outboard motor purchased and registered with Yamaha Motor Corporation, U.S.A. for pleasure use in the United States, will be warranted against defects in material or workmanship for a period of two (2) years from date of purchase, subject to exclusions noted herein. Any Yamaha outboard motor purchased and utilized for commercial applications will be warranted for a period of one (1) year from the date of purchase, subject to exclusions noted herein. Yamaha peripheral equipment included with the motor, such as gauges, fuel tanks and hoses, remote control boxes, propellers, and wiring external from the motor unit, will be warranted for one (1) year from the date of purchase for either pleasure or commercial use. Replacement parts used in warranty repairs will be warranted for the balance of the applicable warranty period.

The second year of warranty (if applicable) shall be limited to covering the cost of parts and labor for major components only. The major components covered are:

Power Unit Section
- Power Head
- Intake Manifold and Reed Valve Assembly
- Carburetor Assembly and its Related Components
- Fuel and Oil Pump Assemblies
- Ignition System (Standard and Microcomputer)
- Precision Blend® System

Bracket Section
- Bracket System
- Power Trim and Tilt Assembly

Lower Unit Section
- Exhaust System
- Upper Casing
- Lower Unit Assembly
- Lower Unit Assembly

The warranty described here applies to outboard motor purchased and registered for use in the United Sates only excluding its territories. For warranty provisions outside the United States, contact the particular country's local Yamaha distributor.

WARRANTY REGISTRATION. To be eligible for warranty coverage, the outboard motor must first be registered with Yamaha Motor Corporation, U.S.A. A warranty registration form is provided in the Owner's Manual with each outboard. This form must be completed and mailed to Yamaha by either the selling dealer or the purchaser. Warranty registration can also be accomplished by any authorized Yamaha outboard dealer. Upon receipt of the registration, an Owner's Warranty Card will be sent by Yamaha to the registered purchaser.

OBTAINING REPAIRS UNDER WARRANTY. To receive repairs under this warranty, a valid Owner's Warranty Card must be presented to an authorized Yamaha outboard dealer.
During the period of warranty, any authorized Yamaha outboard dealer will, free of charge, repair or replace, at Yamaha's option, any parts adjudged defective by Yamaha due to faulty workmanship or material from the factory. All replaced parts will become the property of Yamaha Motor Corporation, U.S.A.

CUSTOMER'S RESPONSIBILITY. Under the terms of this warranty, the customer will be responsible for ensuring that the outboard motor is properly operated, maintained and stored as specified in the applicable Owner's Manual.
The owner of the outboard motor shall give notice to an authorized Yamaha marine dealer of any and all apparent defects within ten (10) days of discovery and make the motor available at that time for inspection and repairs at the dealer's place of business.

GENERAL EXCLUSIONS FROM WARRANTY. This warranty will not cover the repair of damage if the damage is a result of abuse or neglect of the product. Examples of abuse and neglect include, but are not limited to:
1. Racing or competition use, modification of original parts, abnormal strain.
2. Lack of proper maintenance and off-season storage as described in the Owner's Manual, improper mounting of the motor, installation of parts or accessories that are not equivalent in design and quality to genuine Yamaha parts.
3. Operation of the motor at an rpm other than specified, improper propeller selection, use of lubricants, oils, and fuel/oil mixtures that are not suitable for outboard motor use.

EMU00912

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Lower Unit Section
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3. Operation of the motor at an rpm other than specified, improper propeller selection, use of lubricants, oils, and fuel/oil mixtures that are not suitable for outboard motor use.

1-3

4. Damage as a result of accidents, collisions, contact with foreign materials, or submersion.
5. Growth of marine organisms on motor surfaces.
6. Normal deterioration.

SPECIFIC PARTS EXCLUDED FROM WARRANTY. Parts replaced due to normal wear or routine maintenance such as oil, spark plugs, shear pins, propellers, hubs, fuel and oil filters, brushes for the starter motor and power tilt motor, water pump impellers, and anodes are not covered by warranty. Charges for removal of the motor from a boat and transporting the motor to and from an authorized Yamaha outboard dealer are excluded from warranty coverage.
Specific parts excluded from the second year of warranty (if applicable) are:
- Top and Bottom Cowling
- Electric Components (other than ignition system)
- Rubber Components (such as hoses, tubes, rubber seals, fittings, and clamps)

TRANSFER OF WARRANTY. Transfer of the warranty from the original purchaser to any subsequent purchaser is possible by having the motor inspected by an authorized Yamaha outboard dealer and requesting the dealer to submit a change of registration to Yamaha Motor Corporation, U.S.A. within ten (10) days of the transfer.

EMISSION CONTROL SYSTEM WARRANTY. Yamaha warrants to the ultimate purchaser and each subsequent purchaser, that this engine is designed, built, and equipped so as to conform at the time of sale with applicable regulations under section 213 of the Clean Air Act and this engine is free from defects in materials and workmanship which cause said engine to fail to conform with applicable regulations for one (1) year from date of purchase.

YAMAHA MOTOR CORPORATION, U.S.A. MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE OBLIGATIONS AND TIME LIMITS STATED IN THIS WARRANTY ARE HEREBY DISCLAIMED BY YAMAHA MOTOR CORPORATION, U.S.A. AND EXCLUDED FROM THIS WARRANTY.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. ALSO EXCLUDED FROM THIS WARRANTY ARE ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING LOSS OF USE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

YAMAHA MOTOR CORPORATION, U.S.A.
Post Office Box 6555
Cypress, California 90630

4. Damage as a result of accidents, collisions, contact with foreign materials, or submersion.
5. Growth of marine organisms on motor surfaces.
6. Normal deterioration.

SPECIFIC PARTS EXCLUDED FROM WARRANTY. Parts replaced due to normal wear or routine maintenance such as oil, spark plugs, shear pins, propellers, hubs, fuel and oil filters, brushes for the starter motor and power tilt motor, water pump impellers, and anodes are not covered by warranty. Charges for removal of the motor from a boat and transporting the motor to and from an authorized Yamaha outboard dealer are excluded from warranty coverage.
Specific parts excluded from the second year of warranty (if applicable) are:
- Top and Bottom Cowling
- Electric Components (other than ignition system)
- Rubber Components (such as hoses, tubes, rubber seals, fittings, and clamps)

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YAMAHA MOTOR CORPORATION, U.S.A.
Post Office Box 6555
Cypress, California 90630

WARRANTY QUESTIONS AND ANSWERS

Q. What costs are my responsibility during the warranty period?
A. The customer's responsibility includes all costs of normal maintenance services, non-warranty repairs, accident and collision damages.

Q. What are some examples of "abnormal" strain, neglect, or abuse?
A. These terms are general and overlap each other in areas. Specific examples include:
Running the machine out of oil, operating the machine with a broken or damaged part which causes another part to fail, damage or failure due to improper or careless transportation, and/or tie down. If you have any specific questions on operation or maintenance, please contact your Yamaha outboard dealer for advice.

Q. Does the warranty cover incidental costs such as towing or transportation due to a failure?
A. No. The warranty is limited to repair of the machine itself.

Q. May I perform any or all of the recommended maintenance shown in the Owner's Manual instead of having the dealer do them?
A. Yes, if you are a qualified mechanic and follow the procedures specified in the Owner's and Service Manuals. We do recommend, however, that items requiring special tools or equipment be done by a Yamaha outboard dealer.

Q. Will the warranty be void or canceled if I do not operate or maintain my new outboard exactly as specified in the Owner's Manual?
A. No. The warranty on a new outboard cannot be "voided" or "canceled". **However, if a particular failure is caused by operation or maintenance other than as shown in the Owner's Manual, that failure may not be covered under warranty.**

Q. What responsibility does a Yamaha outboard dealer have under this warranty?
A. Each Yamaha outboard dealer is expected to:
1. Completely set up each outboard he sells prior to delivery.
2. Explain the operation, maintenance, and warranty requirements to your satisfaction at the time of sale, and upon your request at any later date.
In addition, each Yamaha outboard dealer is held responsible for his setup, service and warranty repair work.

Q. Is the warranty transferable to second owners?
A. Yes. The remainder of any existing warranty can be transferred upon request. The unit has to be inspected and re-registered by an authorized Yamaha outboard dealer for the policy to remain effective.

CUSTOMER SERVICE

If your machine requires warranty service, you must take it to any authorized Yamaha outboard dealer within the continental United States. Be sure to bring your warranty registration identification or other valid proof of the original date of purchase. If a question or problem arises regarding warranty, first contact the owner of the dealership. Since all warranty matters are handled at the dealer level, this person is in the best position to help you. If you are still not satisfied and require additional assistance, please write:

YAMAHA MOTOR CORPORATION U.S.A.
CUSTOMER RELATIONS DEPARTMENT
P.O.Box 6555
Cypress, California 90630

When contacting Yamaha Motor Corporation, U.S.A. don't forget to include any important information such as names, addresses, model, engine serial number, dates, and receipts.

CHANGE OF ADDRESS

The federal government requires each manufacturer of a motor vehicle to maintain a complete, up-to-date list of all first purchasers against the possibility of a safety-related defect and recall. This list is complied from the purchase registrations sent to Yamaha Motor Corporation, U.S.A. by the selling dealer at the time of your purchase.
If you should move after you have purchased your new outboard, please advise us of your new address by sending a postcard listing your outboard model name, engine serial number, dealer number (or dealer's name) as it is shown on your warranty identification, your name and new mailing address. Mail to:

YAMAHA MOTOR CORPORATION, U.S.A.
WARRANTY DEPARTMENT
P.O.Box 6555
Cypress, California 90630

This will ensure that Yamaha Motor Corporation, U.S.A. has an up-to-date registration record in accordance with federal law.

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If you should move after you have purchased your new outboard, please advise us of your new address by sending a postcard listing your outboard model name, engine serial number, dealer number (or dealer's name) as it is shown on your warranty identification, your name and new mailing address. Mail to:

YAMAHA MOTOR CORPORATION, U.S.A.
WARRANTY DEPARTMENT
P.O.Box 6555
Cypress, California 90630

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1-5

EMA55000

IMPORTANT WARRANTY INFORMATION IF YOU USE YOUR YAMAHA OUTSIDE THE U.S.A. OR CANADA

Welcome to the Yamaha Family!

Congratulations on the purchase of your new Yamaha marine power. Yamaha is committed to exceptional customer satisfaction, and we want your ownership experience to be a satisfying one. Please read this warranty information to help ensure satisfaction with your Yamaha.

This model was manufactured as a U.S.A. specification model, and the warranty statement shown in this manual is for market. To receive the benefits of the warranty that applies to the country in which you use your Yamaha, please note the following information.

1. The warranty on this model is the same as equivalent models sold in the country where you will receive service. If you need more information about your warranty coverage or your Yamaha outside the U.S.A. or Canada, please contact an authorized Yamaha dealer in your country.

2. Keep a copy of your sales contract or invoice for the purchase of your Yamaha and present it if you need warranty repairs. This document should show the date of purchase, which is important evidence the repairing dealer will need to be sure your Yamaha is covered by warranty.

3. If your Yamaha needs warranty repairs, contact an authorized Yamaha dealer in the country where you are. He will explain how to get warranty service in that country.

4. This Yamaha model may not be sold in some countries. Therefore, in some cases your local dealer may not have all the parts or service information he may need, which may unavoidably delay repairs. If this happens, we thank you for your understanding and assure you we will attempt to resolve the situation as quickly as possible.

EMA55000

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EMU00917

⚠ SAFETY INFORMATION

- Before mounting or operating the outboard motor, read this entire manual. Reading it should give you an understanding of the motor and its operation.
- Before operating the boat, read any owner's or operator's manuals supplied with it and all labels. Be sure you understand each item before operating.
- Do not overpower the boat with this outboard motor. Overpowering the boat could result in loss of control. The rated power of the outboard should be equal to or less than the rated horsepower capacity of the boat. If the rated horsepower capacity of the boat is unknown, consult the dealer or boat manufacturer.
- Do not modify the outboard. Modifications could make the motor unfit or unsafe to use.
- Never operate after drinking alcohol or taking drugs. About 50% of all boating fatalities involve intoxication.
- Have an approved personal flotation device (PFD) on board for every occupant. It is a good idea to wear a PFD whenever boating. At a minimum, children and non-swimmers should always wear PFDs, and everyone should wear PFDs when there are potentially hazardous boating conditions.
- Gasoline is highly flammable, and its vapors are flammable and explosive. Handle and store gasoline carefully. Make sure there are no gas fumes or leaking fuel before starting the engine.
- This product emits exhaust gases which contain carbon monoxide, a colorless, odorless gas which may cause brain damage or death when inhaled. Symptoms include nausea, dizziness, and drowsiness. Keep cockpit and cabin areas well ventilated. Avoid blocking exhaust outlets.
- Check throttle, shift, and steering for proper operation before starting the engine.
- Attach the engine stop switch lanyard to a secure place on your clothing, or your arm or leg while operating. If you accidentally leave the helm, the lanyard will pull from the switch, stopping the engine.
- Know the marine laws and regulations where you will be boating - and obey them. Refer to "RULES OF THE ROAD" section for basic boating rules.
- Stay informed about the weather. Check weather forecasts before boating. Avoid boating in hazardous weather.
- Tell someone where you are going: leave a Float Plan with a responsible person. Be sure to cancel the Float Plan when you return.
- Use common sense and good judgment when boating. Know your abilities, and be sure you understand how your boat handles under the different boating conditions you may encounter. Operate within your limits, and the limits of your boat. Always operate at safe speeds, and keep a careful watch for obstacles and other traffic.
- Always watch carefully for swimmers during the engine operation.

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- Always watch carefully for swimmers during the engine operation.

2-1

- Stay away from swimming areas.
- When a swimmer is in the water near you shift into neutral and shut off the engine.
- Be informed about boating safety. Additional publications and information can be obtained from many organizations, including the following:

United States Coast Guard

Consumer Affairs Staff (G-BC)
Office of Boating, Public, and Consumer Affairs
U.S. Coast Guard Headquarters
Washington, D.C. 20593-0001
Boating Safety Hotline: 1-800-368-5647

National Marine Manufacturers Association (NMMA)

401 N. Michigan Ave.
Chicago, Il 60611

Marine Retailers Association of America

155 N. Michigan Ave.
Chicago, Il 60601

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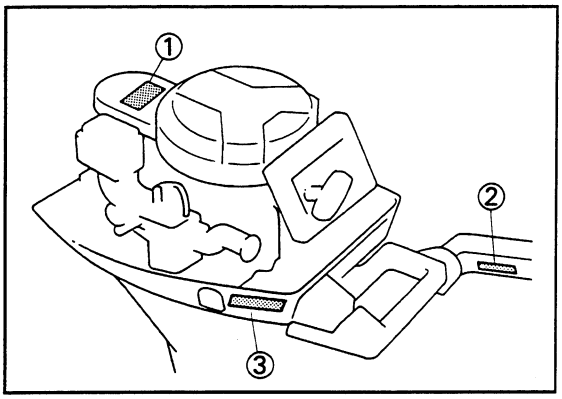


EMA80001

IMPORTANT LABELS

Warning labels

①

⚠ WARNING

- Be sure shift control is in neutral before starting engine. (except 2HP)
- Do not touch or remove electrical parts when starting or during operation.
- Keep hands, hair, and clothes away from flywheel and other rotating parts while engine is running.

6A1-83625-41

②

⚠ WARNING

This engine is equipped with a neutral starting device. The engine will not start unless the shift control is in neutral position

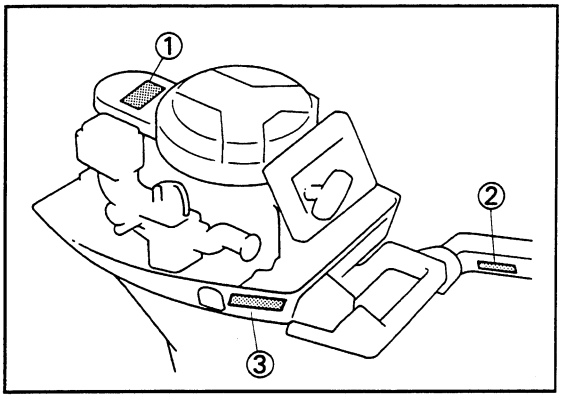
6E0-83627-41

Caution label

③

CAUTION

Transport and store the engine only as shown. Otherwise, engine damage could result from leaking oil.



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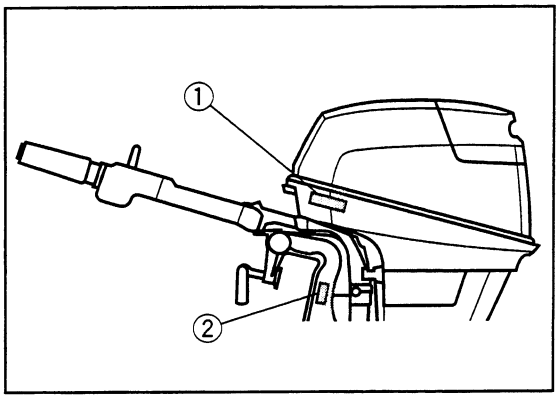


GENERAL INFORMATION

EMU00947*

Emission control information

This engine conforms to 1999 U.S. Environment Protection Agency (EPA) regulation for marine SI engines.

Approval label of Emission control certificate

This label is attached to the bottom cowling.

① Emission control information label

EMISSION CONTROL INFORMATION		EM
ENGINE FAMILY : XYYMXM		
THIS ENGINE CONFORMS TO 1999 U.S. EPA REGULATIONS FOR MARINE SI ENGINES.		
FELs : g/kw-hr	IDLE SPEED : rpm IN NEUTRAL	
SPARK PLUG :	SPARK PLUG GAP (mm) :	
DISPLACEMENT : cm³	FUEL : GASOLINE	
ADVERTISED POWER : kw	VALVE LASH (mm) : IN EX	
YAMAHA MOTOR CO.,LTD.		

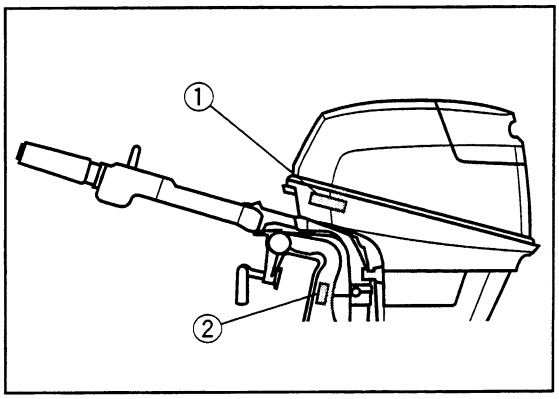
New Technology ; (4-stroke) EM

Manufactured date label

This label is attached to the clamp bracket.

② Manufactured date label

YAMAHA
Manufactured: □□□□□



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SPARK PLUG :	SPARK PLUG GAP (mm) :	
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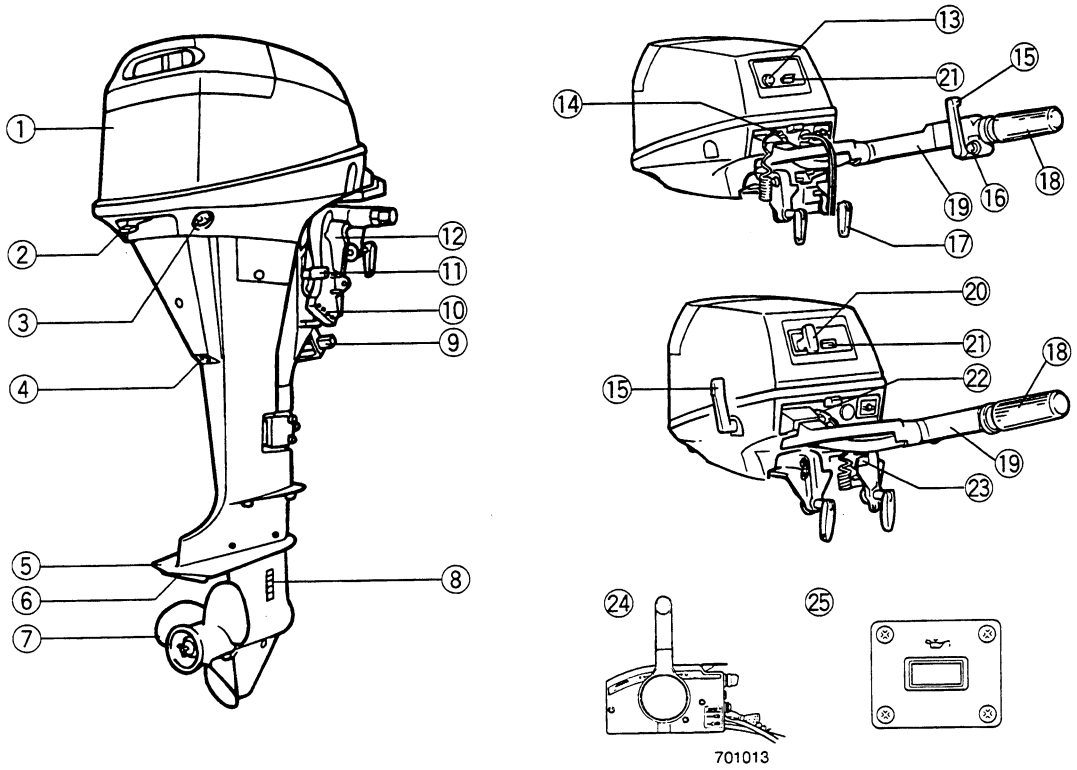
YAMAHA
Manufactured: □□□□□

3-1

EMB00000

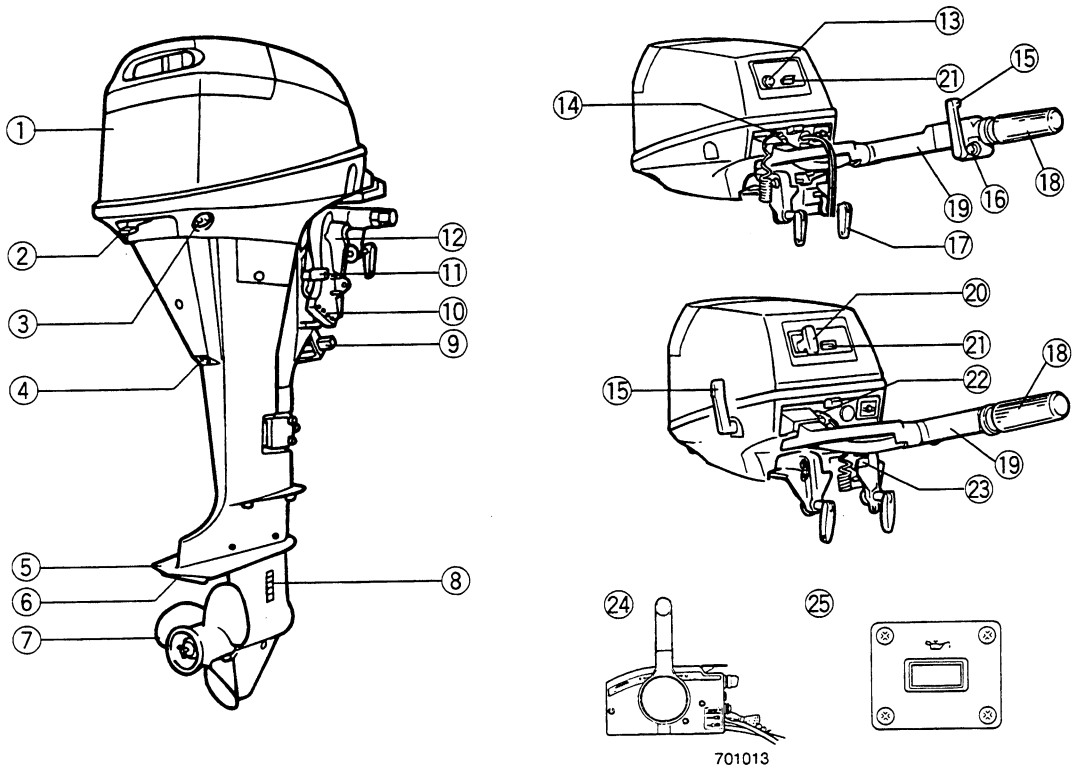
MAIN COMPONENTS



701013

EMB00000

MAIN COMPONENTS



701013

① Top cowling

② Cowling lock lever

③ Cooling water pilot hole

④ Engine oil drain bolt

⑤ Anti-cavitation plate

⑥ Anode

⑦ Propeller

*⑧ Cooling water inlet

*⑨ Shallow water lever

⑩ Trim angle adjusting rod

⑪ Tilt support lever

⑫ Clamp bracket

*⑬ Starter button

⑭ Engine stop lanyard switch

⑮ Gear-shift lever

⑯ Engine stop button

⑰ Clamp screw

⑱ Throttle control grip

⑲ Tiller handle

*⑳ Recoil starter handle

㉑ Oil pressure indicator

㉒ Engine stop button / Engine stop lanyard switch

㉓ Tilt lock lever

㉔ Remote control box

㉕ Oil pressure indicator panel

* It differs on specifications.

① Top cowling

② Cowling lock lever

③ Cooling water pilot hole

④ Engine oil drain bolt

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㉔ Remote control box

㉕ Oil pressure indicator panel

* It differs on specifications.

EMB10001

FUELING INSTRUCTIONS

⚠WARNING

GASOLINE AND ITS VAPORS ARE HIGHLY FLAMMABLE AND EXPLOSIVE!

- **Do not smoke when refueling, and keep away from sparks, flames, or other sources of ignition.**
- **Stop engine before refueling.**
- **Refuel in a well-ventilated area. Refuel portable fuel tanks off the boat.**
- **Take care not to spill gasoline. If gasoline spills, wipe it up immediately with dry rags.**
- **Do not overfill the fuel tank.**
- **Tighten the filler cap securely after refueling.**
- **If you should swallow some gasoline inhale a lot of gasoline vapor, or get gasoline in your eyes, get immediate medical attention.**
- **If any gasoline spills onto your skin, immediately wash with soap and water. Change clothing if gasoline spills on it.**
- **Touch the fuel nozzle to the filler opening or funnel to help prevent electrostatic sparks.**

CAUTION:

Use only new clean gasoline which has been stored in clean containers and is not contaminated with water or foreign matter.

Gasoline (Petrol)

Recommended gasoline:
Regular unleaded gasoline with a minimum octane rating of 86 (Pump octane number): (R+M)/2

If knocking or pinging occurs, use a different brand of gasoline or premium unleaded fuel. Unleaded fuel will give you longer spark plug life and reduced maintenance cost. If unleaded gasoline is not available, then leaded regular gasoline can be used.

Gasohol

There are two types of gasohol: gasohol containing ethanol and that containing methanol. Gasohol containing ethanol can be used if ethanol content does not exceed 10% and the fuel meets minimum octane ratings. Gasohol containing methanol is not recommended by Yamaha because it can cause fuel system damage or engine performance problems.

EMB10001

FUELING INSTRUCTIONS

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- If you should swallow some gasoline inhale a lot of gasoline vapor, or get gasoline in your eyes, get immediate medical attention.
- If any gasoline spills onto your skin, immediately wash with soap and water. Change clothing if gasoline spills on it.
- Touch the fuel nozzle to the filler opening or funnel to help prevent electrostatic sparks.

CAUTION:

Use only new clean gasoline which has been stored in clean containers and is not contaminated with water or foreign matter.

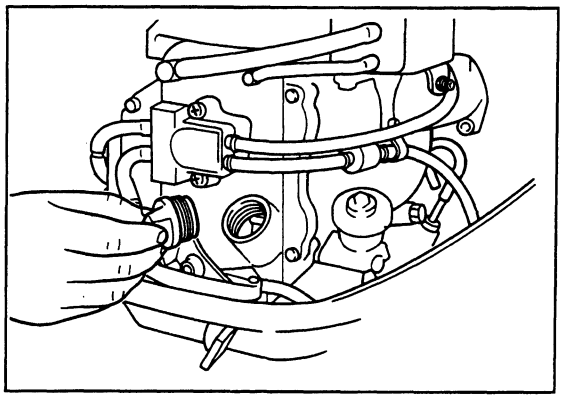
Gasoline (Petrol)

Recommended gasoline:
Regular unleaded gasoline with a minimum octane rating of 86 (Pump octane number): (R+M)/2

If knocking or pinging occurs, use a different brand of gasoline or premium unleaded fuel. Unleaded fuel will give you longer spark plug life and reduced maintenance cost. If unleaded gasoline is not available, then leaded regular gasoline can be used.

Gasohol

There are two types of gasohol: gasohol containing ethanol and that containing methanol. Gasohol containing ethanol can be used if ethanol content does not exceed 10% and the fuel meets minimum octane ratings. Gasohol containing methanol is not recommended by Yamaha because it can cause fuel system damage or engine performance problems.



EMB11201

Engine Oil

Recommended oil:

Use a combination of the corresponding SAE and API shown in the chart below.

Example 10W-30.....SE
10W-30.....SF
10W-30.....SE-SF
10W-30.....SE-SF-CC
10W-30.....SG-CD

SAE	API
10W-30 10W-40 20W-40	SE, SF SE-SF SE-SF-CC SG-CD

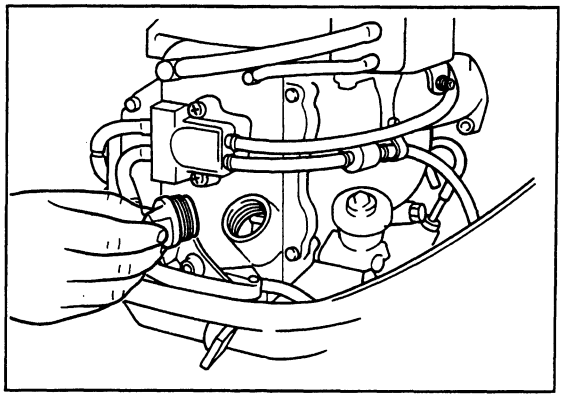
CAUTION:

Avoid using the SAE 20W-40 type when temperature is below 20°C (68°F).

Oil sump capacity: Refer to SPECIFICATIONS

NOTE:

To fill the sump, use a clean funnel, and place a dry cloth around the oil filler. Slightly incline the outboard motor, and pour the oil in slowly through the funnel.



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EMB13001

Filling Fuel

1) Remove the fuel tank cap.
2) Fill the fuel tank carefully.
3) Close the cap securely after refueling. Wipe up any spilled fuel.

Fuel tank capacity: Refer to SPECIFICATIONS.

Ring Free Fuel Additive

Gasoline is a precise blend of many different substances, each chosen to give certain characteristics. Gasoline blends have been changing in recent years in response to concerns about pollution and resulting emissions regulations. One of the most obvious changes has been the elimination of lead from most fuels.

As gasoline has changed, the amount of additives such as aromatics and oxygenates has increased. These additives are important for the engines in passenger cars, but they can have detrimental effects in marine engines, particularly 2-cycle outboards because of increased deposits in the combustion chamber. When enough deposits collect, piston rings begin sticking. Performance drops and engine wear increases dramatically.

While many additives available may reduce deposits, Yamaha recommends the use of **Ring Free Fuel Additive**, available from your Yamaha dealer. Ring Free has repeatedly proven its ability to clean combustion deposits from inside the engine, notably the critical piston-ring-land area, and fuel system components. Follow product labeling for use instructions.

EMB50003

BATTERY REQUIREMENT (for Electric start model)

Choose battery which meets the following specifications.

Minimum cold crank performance: 380 Amps at - 17.8 °C (0°F) Minimum reserve capacity: 124 minutes at 26.7 °C (80°F)

CAUTION:

Do not use the battery that does not meet the specified capacity. If different battery from the specification is used, the electric system may perform poorly or be overloaded, causing electrical system damage.

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1) Remove the fuel tank cap.
2) Fill the fuel tank carefully.
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Fuel tank capacity: Refer to SPECIFICATIONS.

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EMB60001

PROPELLER SELECTION

The performance of your outboard motor will be critically affected by your choice of propeller, for an incorrect one could adversely affect performance and could seriously damage the motor. The engine speed depends on the propeller size and the boat load. If the engine speed is too high or too low for good engine performance, this will have an adverse effect on the engine.

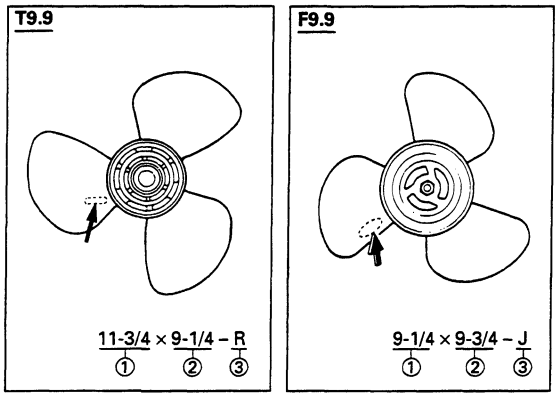
Yamaha outboard motors are fitted with propellers chosen to perform well over a range of applications, but there may be uses where a propeller with a different pitch would be better. For a greater operating load, a smaller-pitch propeller is more suitable as it enables the correct engine speed to be maintained. Conversely, a larger-pitch propeller is more suitable for a smaller operating load.

Yamaha dealers stock a range of propellers, and can advise you and install a propeller on your outboard that is best suited to your application.

NOTE:

Select a propeller which will allow the engine to reach the middle or upper half of the operating range at full throttle with the maximum boat load. If operating conditions such as light boat loads then allow the engine rpm to rise above the maximum recommended range, reduce the throttle setting to maintain the engine in the proper operating range.

Recommended full throttle operating range, refer to SPECIFICATIONS.



① Propeller diameter (in inches)
② Propeller pitch (in inches)
③ Type of propeller (Propeller mark)

Propeller removal and installation;
Refer to propeller checking section.

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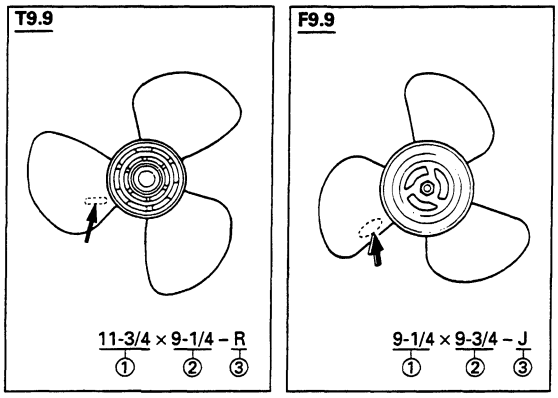

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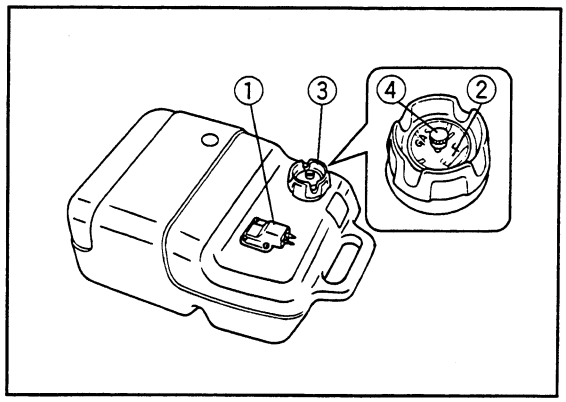


EMC21012

FUEL TANK

If your model was equipped with a portable fuel tank, its function is as follows.

① Fuel hose joint
② Fuel meter(If equipped)
③ Fuel tank cap
④ Air vent screw(If equipped)

Fuel hose joint

This connector is provided for connecting or disconnecting fuel hose.

Fuel meter

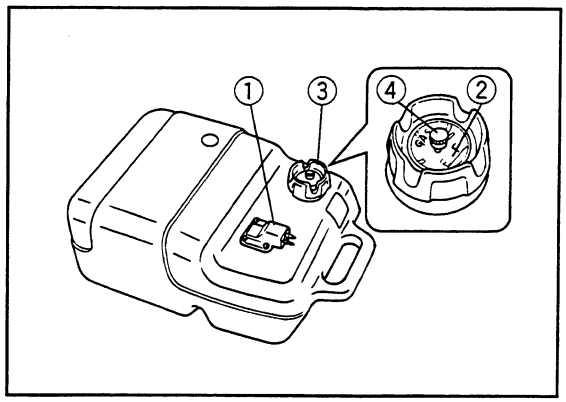
This meter is on the fuel tank cap. It shows current fuel quantity in the fuel tank approximately.

Fuel tank cap

This cap is for filling fuel. To remove it, turn it counterclockwise.

Air Vent screw

This screw is on the fuel tank cap. To loosen it, turn it counterclockwise.



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INSTALLATION

CAUTION:

Incorrect engine height or obstructions to smooth water flow (such as the design or condition of the boat or accessories such as transom ladders/depth finder transducers) can create airborne water spray while the boat is cruising. Severe engine damage may result if the motor is operated continuously in the presence of airborne water spray.

NOTE:

During water testing check the buoyancy of the boat, at rest, with its maximum load. Check that the static water level on the exhaust housing is low enough to prevent water entry into the powerhead, when water rises due to waves when the outboard is not running.

EMC00000

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4-1

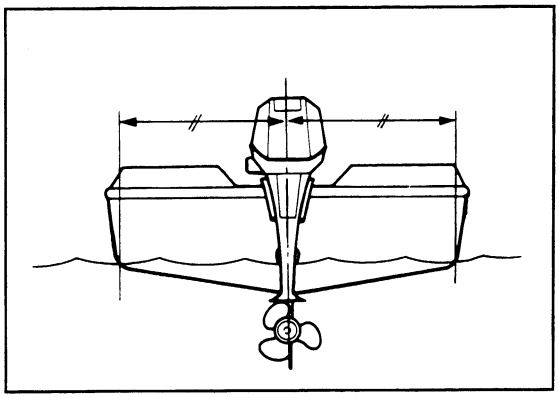
EMC10101

MOUNTING THE OUTBOARD MOTOR

⚠WARNING

Improper mounting of the outboard motor could result in hazardous conditions such as poor handling, loss of control, or fire hazards. Observe the following:

- **The information presented in this section is intended as reference only. It is not possible to provide complete instructions for every possible boat/motor combination. Proper mounting depends in part on experience and the specific boat/motor combination.**
- **Your dealer or other person experienced in proper rigging should mount the motor. If you are mounting the motor yourself, you should be trained by an experienced person. [permanent mounted type]**
- **Your dealer or other person experienced in proper outboard motor mounting should show you how to mount your motor. [portable type]**



Mount the outboard motor on the center line (keel line) of the boat, and ensure that the boat itself is well balanced. Otherwise, the boat will be hard to steer. For boats without a keel or which are asymmetrical, consult your dealer.

⚠WARNING

Overpowering a boat may cause severe instability. Do not install an outboard motor with more horsepower than the maximum rating on the capacity plate of the boat. If the boat does not have a capacity plate, consult the boat manufacturer.

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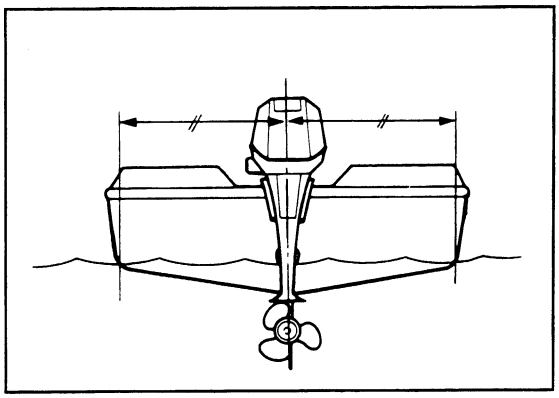

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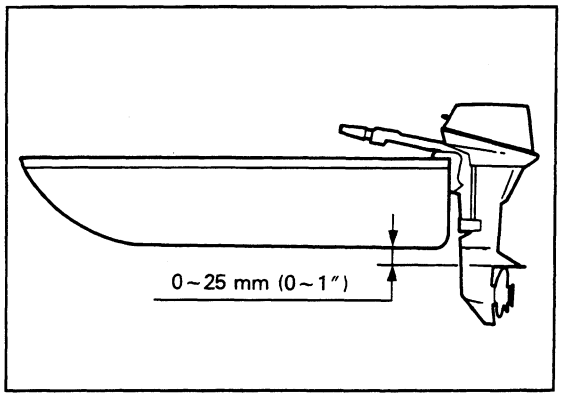
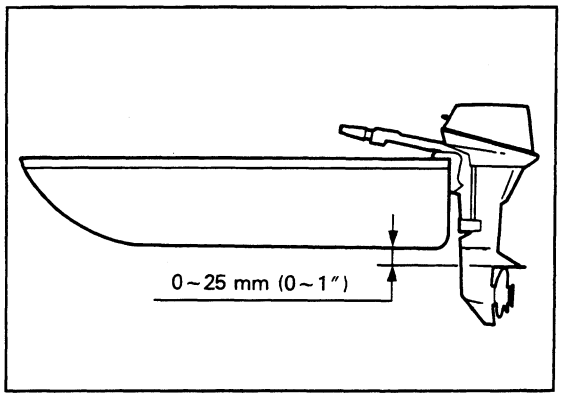


Mounting Height

To run your boat at optimum efficiency, the water-resistance (drag) of the boat and outboard motor must be made as little as possible. The mounting-height of the outboard motor greatly affects the water-resistance. If the mounting-height is too high, cavitation tends to occur, thus reducing the propulsion; and if the propeller tips cut the air, the engine speed will rise abnormally and cause the engine to overheat. If the mounting-height is too low, the water-resistance will increase and thereby reduce engine efficiency. Mount the engine so that the anti-cavitation plate is between the bottom of the boat and a level 25 mm (1") below it.

NOTE:

The optimum mounting height of the outboard motor is affected by the boat/motor combination and the desired use. Test runs at different heights can help determine the optimum mounting height.



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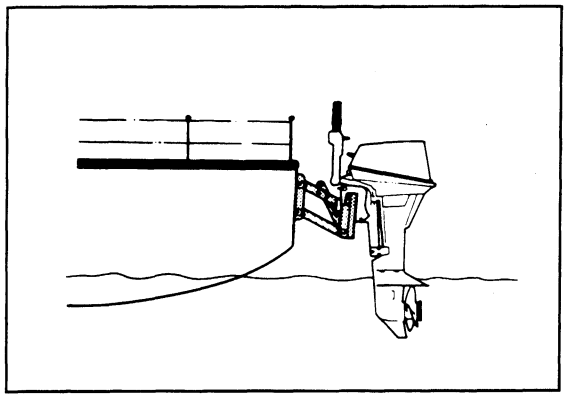
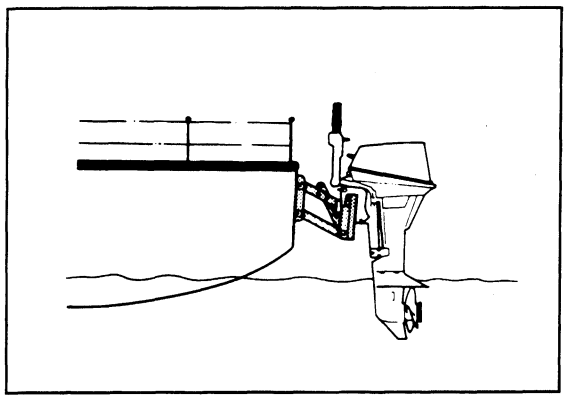


Points to note on sailboats (For T9.9)

When mounting the outboard motor on the motor bracket of a sailboat, check the following points:

1. When using the outboard, the cavitation plate should be 50 mm (2 in) or more below the water surface to prevent propeller damage. Because a sailboat can pitch considerably, mount the motor low enough so that the propeller will not contact the water surface during motor-powered operation.
2. When sailing, the outboard motor should be able to be tilted up out of the water so the propeller does not contact the water spray.
   Disconnect the fuel line connection.
3. Check that the outboard motor does not interfere with the rudder.
4. Check that the engine can be easily started and stopped.
5. Check the ease of operating the gear shift and throttle control.
6. If mounting the outboard motor on a well-type boat, exhaust gases and blow-by gas flow must be allowed to exit the boat. A special kit designed for this purpose can be ordered through your Yamaha dealer.



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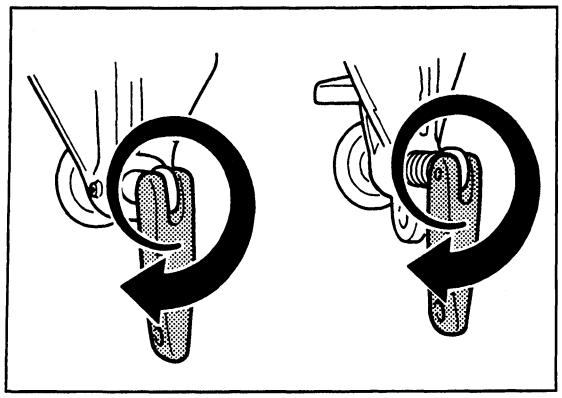
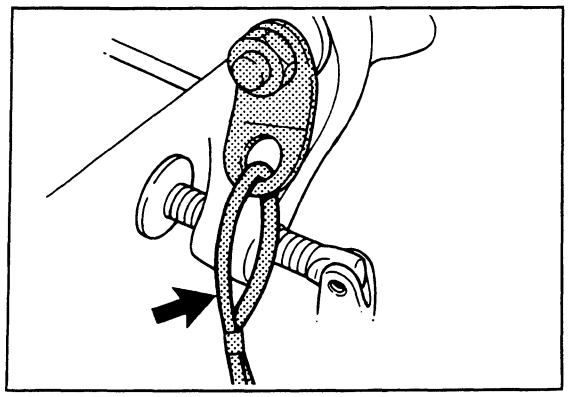
4-4





EMC30000

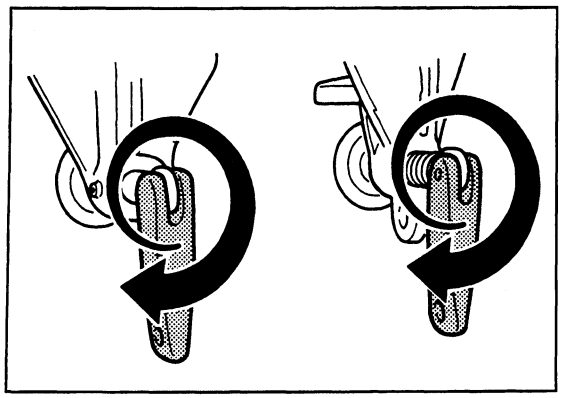
CLAMPING THE OUTBOARD MOTOR

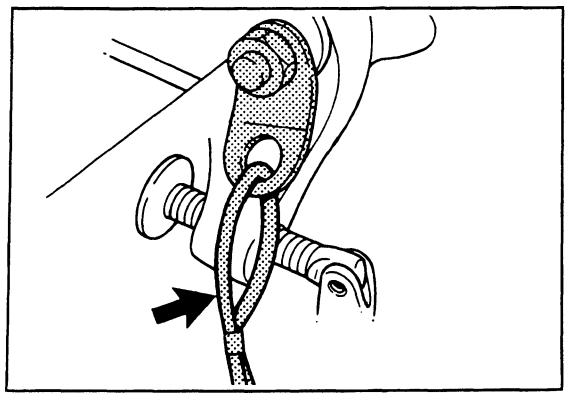
1) Place the outboard on the transom so that it is positioned as close to the center as possible. Tighten the transom clamp screws evenly and securely. Check the clamp-screws for tightness occasionally during operation of the motor as they can work loose due to engine vibration.

⚠WARNING

Loose clamp screws could allow the motor to move on the transom or fall off the transom. This could cause loss of control and serious injury. Make sure the transom screws are tightened securely.
Occasionally check the screws for tightness during operation.

2) An engine restraint cable or chain should be used. Attach one end to the engine restraint cable attachment point and the other to a secure mounting point on the boat. Otherwise, the engine could be completely lost if it accidentally falls off the transom.





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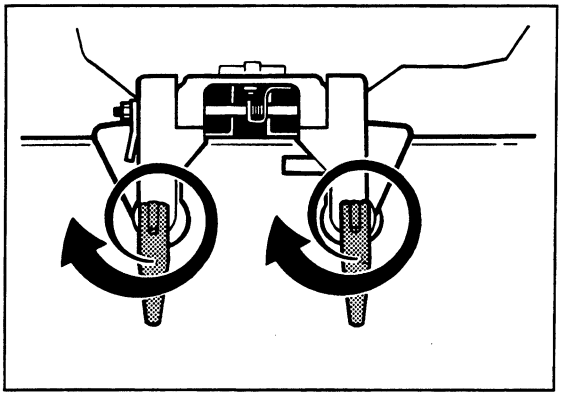

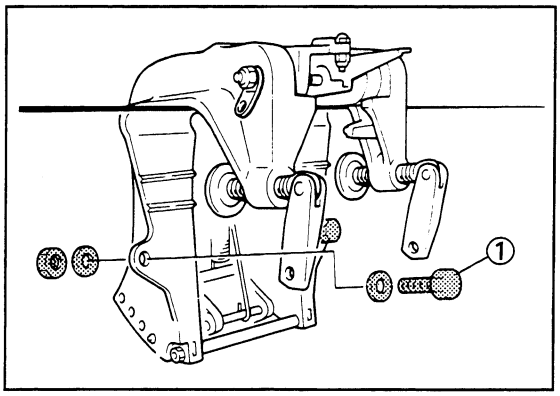

EMC30101

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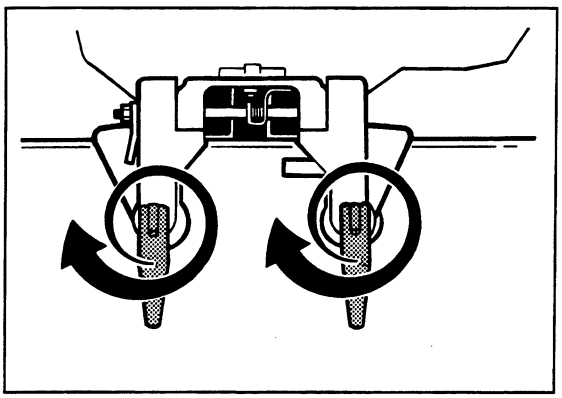
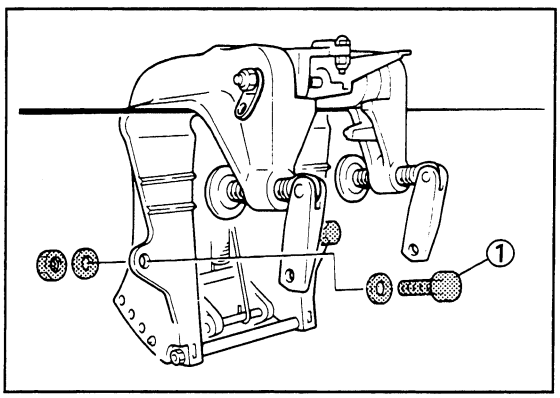
2) Secure the clamp bracket to the transom with the bolts provided with the outboard. For details, consult your dealer.

⚠WARNING

Avoid using bolts, nuts or washers other than those contained in the engine packaging. If used, they must be of at least the same quality of material and strength and must be tightened securely. After tightening, test run the engine and check their tightness.

① Motor mounting parts





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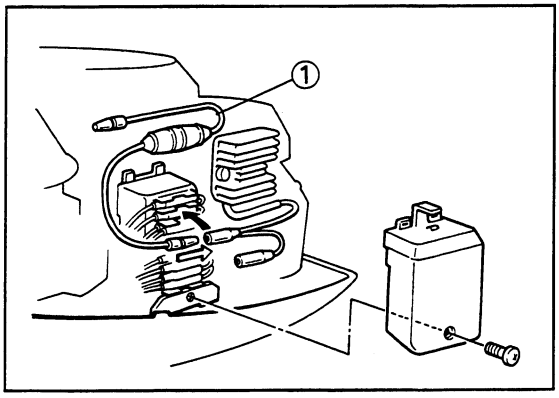
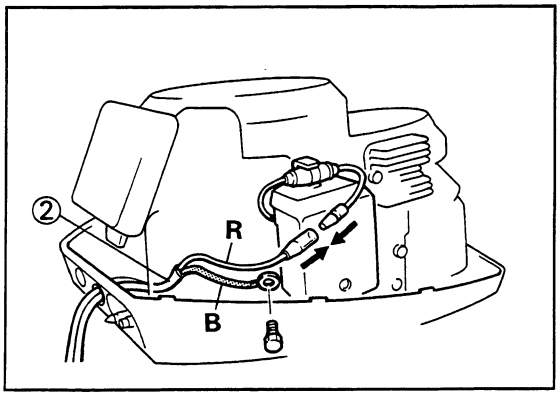




EMC40000

CHARGING BATTERY (for T9.9MH)

If an accessory battery charging is required, proceed the following steps for connecting the charging circuit to the battery. The charge lead and fuse holder for making the circuit are provided in the packing.

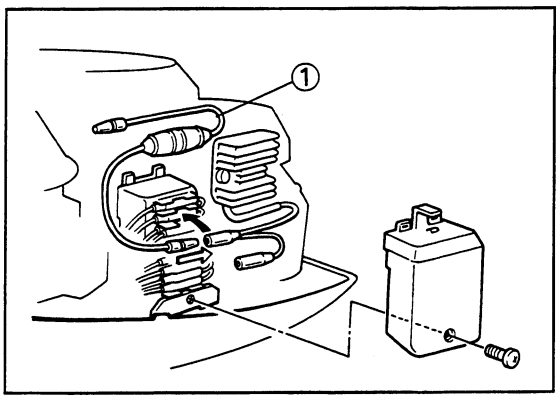
1) Remove the top cowling and remove the CDI unit cover.
2) Connect one of the fuse holder terminals to the red free terminal fixed with the red lead from the rectifier regulator.

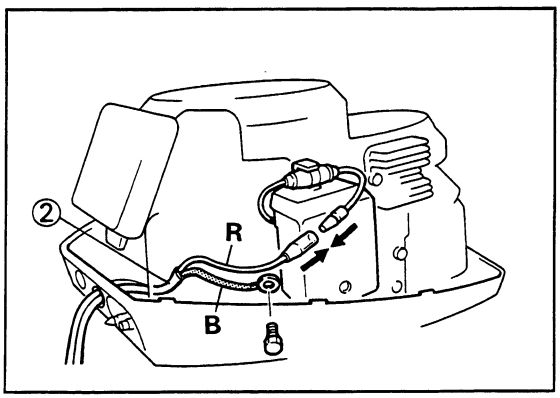
① Fuse holder

3) Reinstall the CDI unit cover and fit the fuse holder onto the top side of the cover.
4) Connect the other fuse holder terminal to the red terminal of the charge lead. Secure the black terminal (ground) of the charge lead to the engine, together with the CDI unit ground terminal.

② Charge lead

5) Pull out the charge lead through the grommet on the port and front side of the bottom cowling.
6) To connect the leads to the battery refer to "CHECKING BATTERY, Connecting the battery" for the correct procedure.





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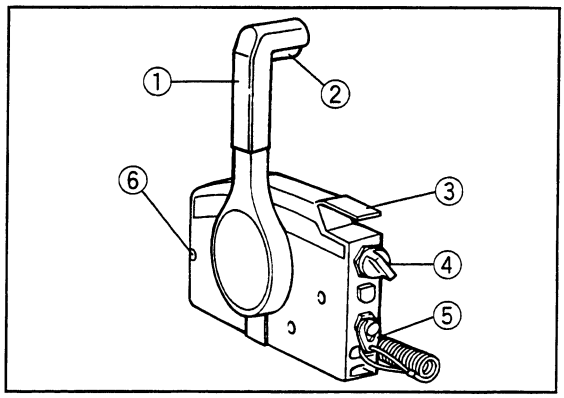
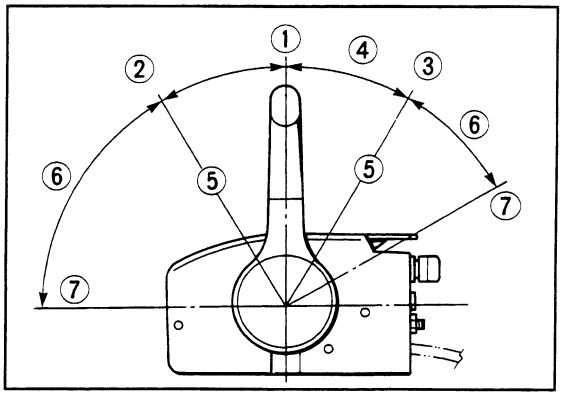




EMD00000

OPERATIONS OF CONTROLS AND OTHER FUNCTIONS

EMD10401

REMOTE CONTROL

Both the shifter and the throttle are actuated by the remote control lever. In addition, this control also has the electrical switches.

① Remote control lever
② Neutral interlock trigger
③ Neutral throttle lever
④ Main switch
⑤ Engine stop lanyard switch
⑥ Throttle friction adjusting screw

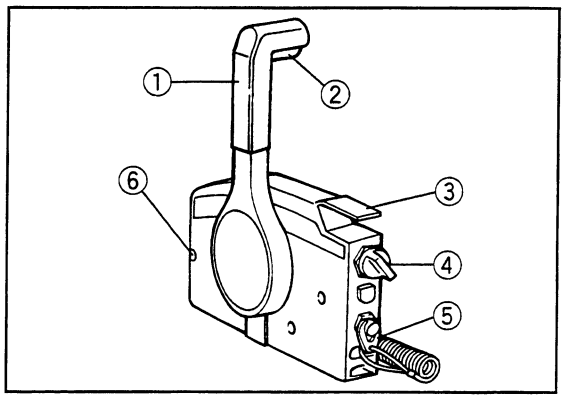
Remote control lever

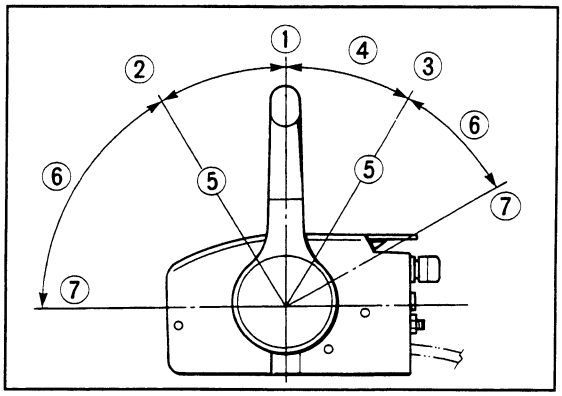
Moving the lever forward from the Neutral position engages Forward gear. Pulling the lever back from Neutral engages Reverse. The engine will continue to run at idle until the lever is moved about 35° (a detent can be felt). Moving the lever farther opens the throttle, and the engine will begin to accelerate.

① Neutral
② Forward
③ Reverse
④ Shift
⑤ Fully closed
⑥ Throttle
⑦ Fully open

Neutral interlock trigger

To shift out of Neutral, the neutral interlock trigger of the remote control lever must first be pulled up.





EMD00000

OPERATIONS OF CONTROLS AND OTHER FUNCTIONS

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③ Reverse
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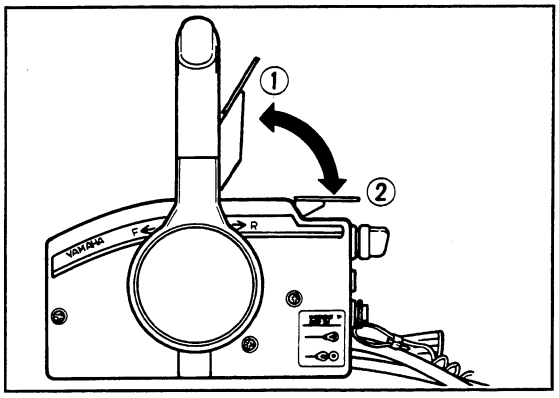
⑥ Throttle
⑦ Fully open

Neutral interlock trigger

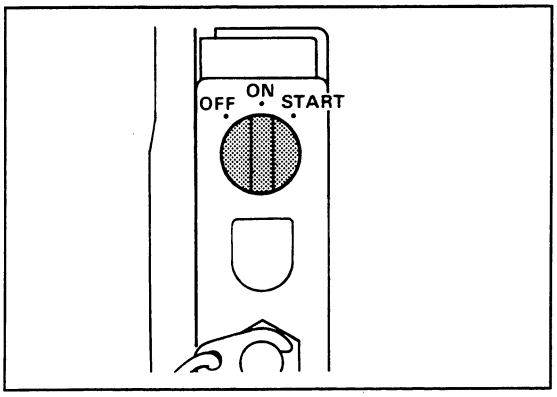
To shift out of Neutral, the neutral interlock trigger of the remote control lever must first be pulled up.



Neutral throttle lever
To open the throttle without shifting into either Forward or Reverse, place the remote control lever in the Neutral position and lift the neutral throttle lever.

NOTE:
The neutral throttle lever will operate only when the remote control lever is in Neutral. The remote control lever will operate only when the neutral throttle lever is in the closed position.

① Fully open
② Fully closed

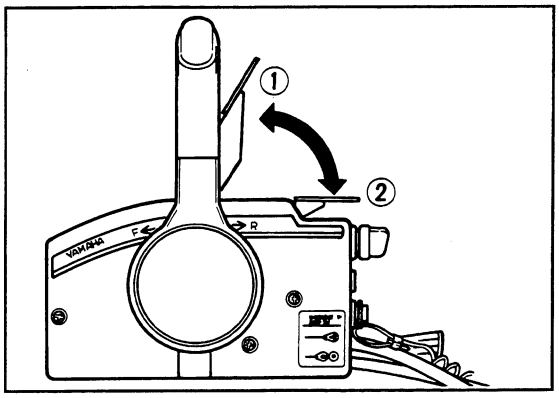


Main switch
The main switch controls the ignition system; its operation is described below.

OFF
Electrical circuits switched off. (The key can be removed.)

ON
Electrical circuits switched on. (The key cannot be removed.)

START
Starter-motor will turn and start engine. (When the key is released, it returns automatically to "ON".)



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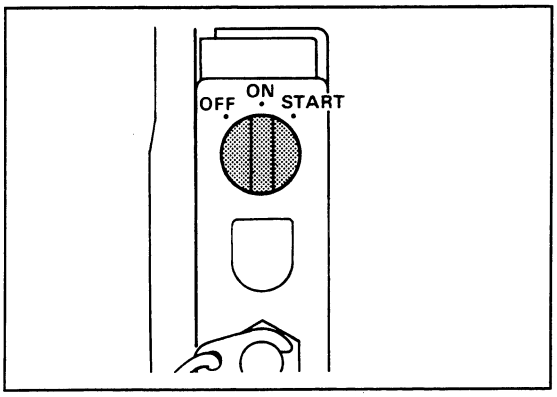

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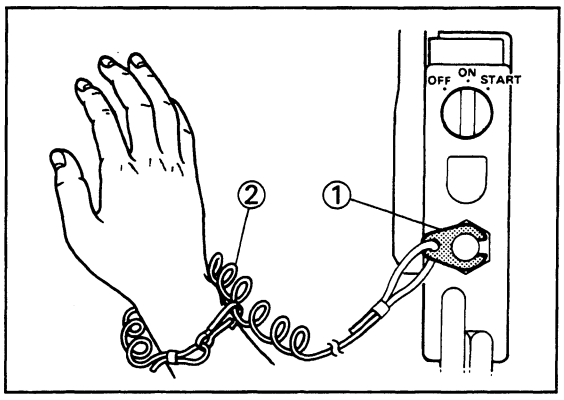


Engine stop lanyard switch

The lock-plate on the end of the lanyard must be attached to the engine stop switch for the engine to run. The lanyard should be attached to a secure place on the operator's clothing, or arm or leg. Should the operator fall overboard or leave the helm, the lanyard will pull out the lock plate, stopping ignition to the engine. This will prevent the boat from running away under power.

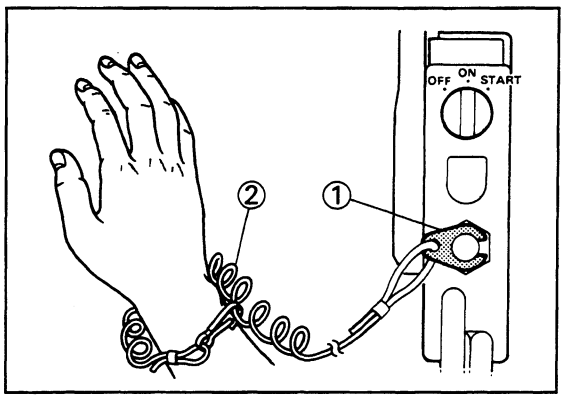
⚠WARNING

- **Attach the engine stop switch lanyard to a secure place on your clothing, your arm or leg while operating.**
- **Do not attach the lanyard to clothing that could tear loose. Do not route the lanyard in such a way that it could become entangled, preventing it from functioning.**
- **Avoid accidentally pulling the lanyard during normal operation. Loss of engine power means the loss of most steering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.**

NOTE:

The engine cannot be started when the lock-plate is removed.

① Lock-plate
② Lanyard



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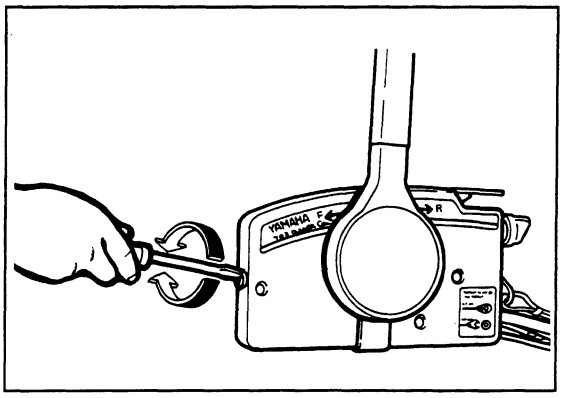


EMD12000

Throttle Friction Adjusting screw

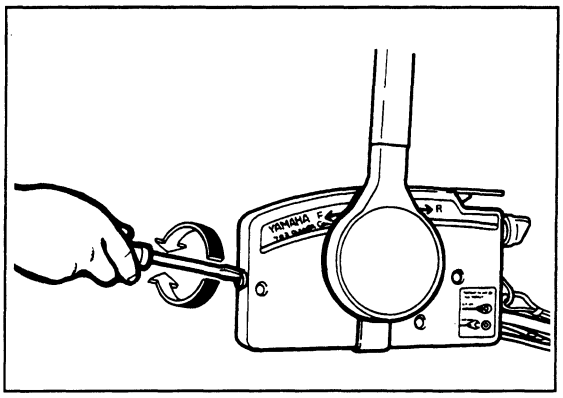
A friction device in the remote control box provides resistance to movement of the remote control lever. This is adjustable for operator preference. An adjusting screw is located at the front of the remote control box.

To increase the resistance:
Turn the adjusting screw clockwise.

To decrease the resistance:
Turn the adjusting screw counterclockwise.

⚠WARNING

Do not overtighten the friction adjusting screw. If there is too much resistance, it may be difficult to move the lever, which could result in an accident.



EMD12000

Throttle Friction Adjusting screw

A friction device in the remote control box provides resistance to movement of the remote control lever. This is adjustable for operator preference. An adjusting screw is located at the front of the remote control box.

To increase the resistance:
Turn the adjusting screw clockwise.

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Turn the adjusting screw counterclockwise.

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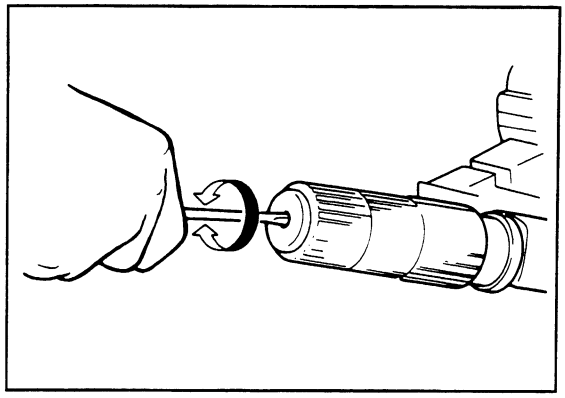


EMD40000

CONTROLS

EMD41001

Throttle Friction Adjustment (for Tiller control model)

A friction device in the tiller handle provides resistance to movement of the throttle grip. This is adjustable for operator preference. An adjusting screw is located within the tiller handle.

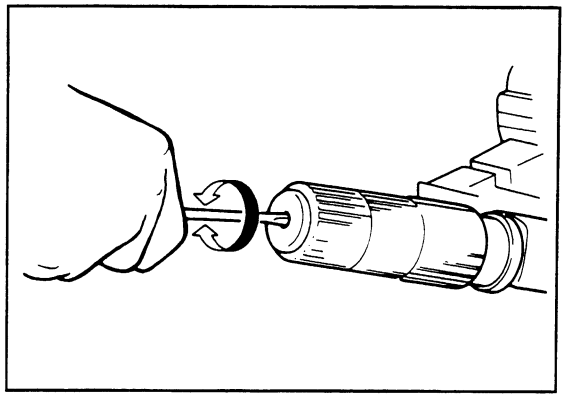
To increase the resistance:
Turn the adjusting screw clockwise.

To decrease the resistance:
Turn the adjusting screw counterclockwise.

When constant speed is desired, tighten the adjusting screw to maintain the desired throttle setting.

⚠WARNING

Do not overtighten the friction adjusting screw. If there is too much resistance, it may be difficult to move the throttle grip, which could result in an accident.



EMD40000

CONTROLS

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A friction device in the tiller handle provides resistance to movement of the throttle grip. This is adjustable for operator preference. An adjusting screw is located within the tiller handle.

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⚠WARNING

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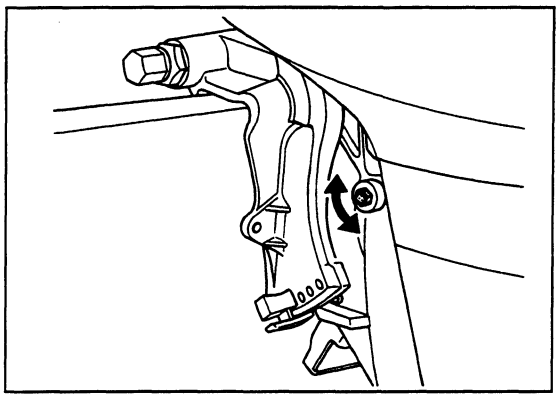


EMD42001

Steering Friction Adjustment (for Tiller control model)

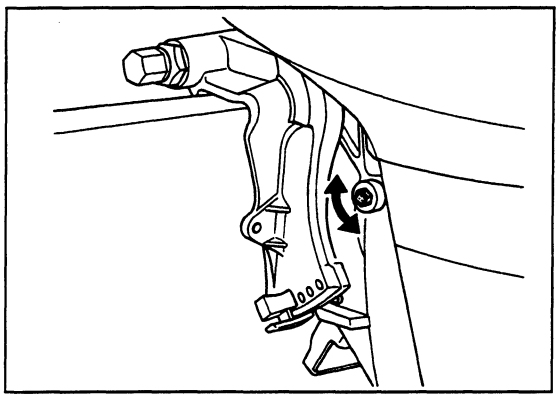
A friction device provides resistance to steering movement. This is adjustable for operator preference.
An adjusting screw is located on the swivel bracket.

To increase the resistance:
Turn the adjusting screw clockwise.

To decrease the resistance:
Turn the adjusting screw counterclockwise.

⚠WARNING

Do not overtighten the friction screw. If there is too much resistance, it may be difficult to steer, which could result in an accident.



EMD42001

Steering Friction Adjustment (for Tiller control model)

A friction device provides resistance to steering movement. This is adjustable for operator preference.
An adjusting screw is located on the swivel bracket.

To increase the resistance:
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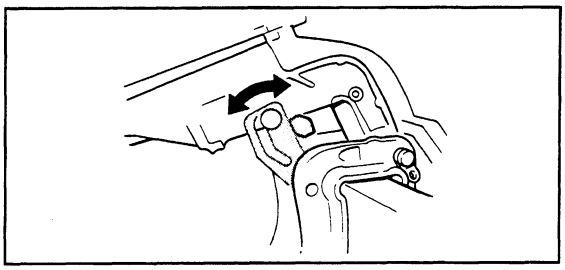
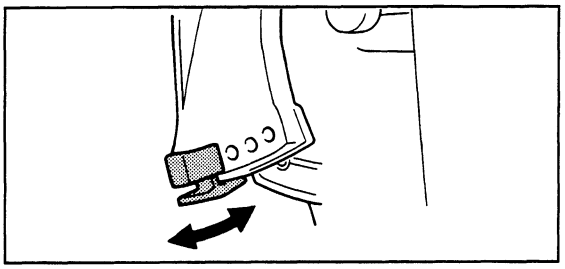


EMD43201

Tilt Support Lever

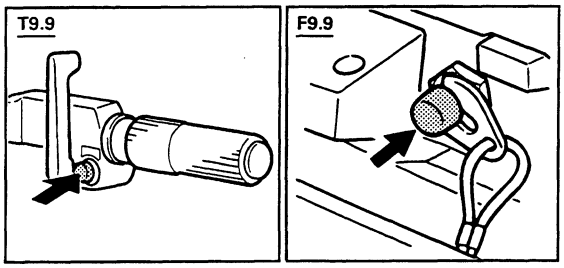
To keep the outboard motor in the tilted-up position, lock the tilt support lever to the swivel bracket.



EMD06011

Trim angle adjusting rod

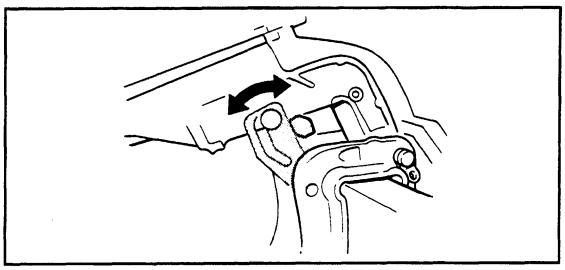
The outboard motor fully trim-in angle setting in relation to the transam can be adjusted by changing the position of the trim angle adjusting-rod.



EMD47001

Engine Stop button (for Tiller control model)

Pushing this button opens the ignition circuit and stops the engine.



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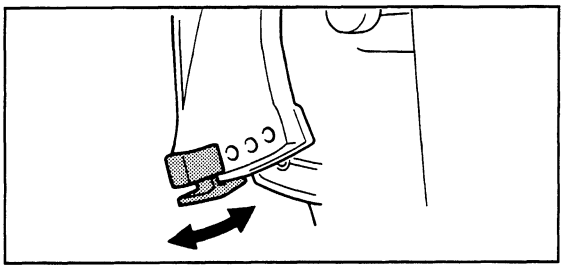

EMD06011

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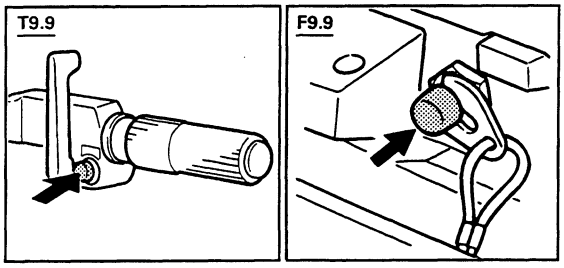

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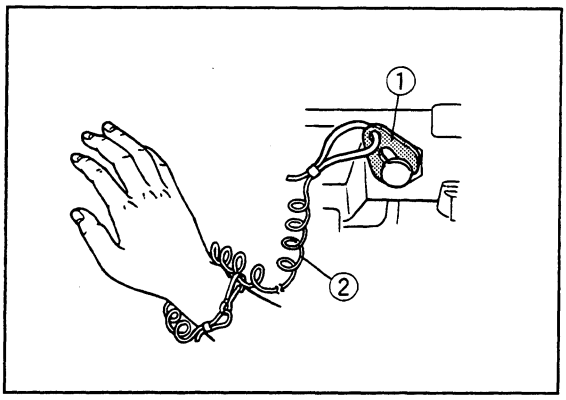


EMC28210

Engine stop lanyard switch

The lock-plate on the end of the lanyard must be attached to the engine stop switch for the engine to run. The lanyard should be attached to a secure place on the operator's clothing, or arm or leg. Should the operator fall overboard or leave the helm, the lanyard will pull out the lock plate, stopping ignition to the engine. This will prevent the boat from running away under power.

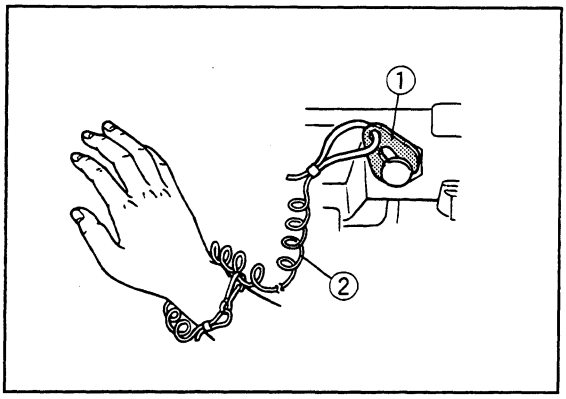
⚠WARNING

- **Attach the engine stop switch lanyard to a secure place on your clothing, your arm or leg while operating.**
- **Do not attach the lanyard to clothing that could tear loose. Do not route the lanyard in such a way that it could become entangled, preventing it from functioning.**
- **Avoid accidentally pulling the lanyard during normal operation. Loss of engine power means the loss of most steering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.**

NOTE:

The engine cannot be started when the lock-plate is removed.

① Lock-plate
② Lanyard



EMC28210

Engine stop lanyard switch

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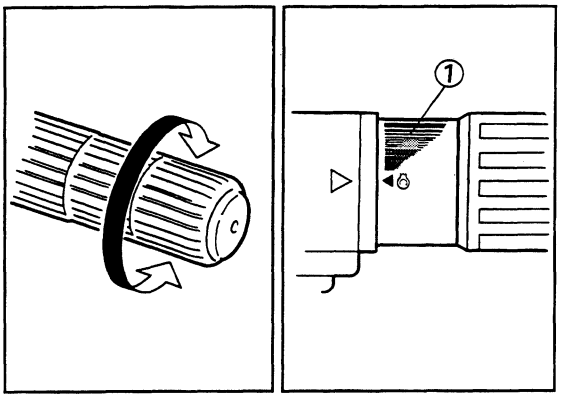
② Lanyard



EMD49003

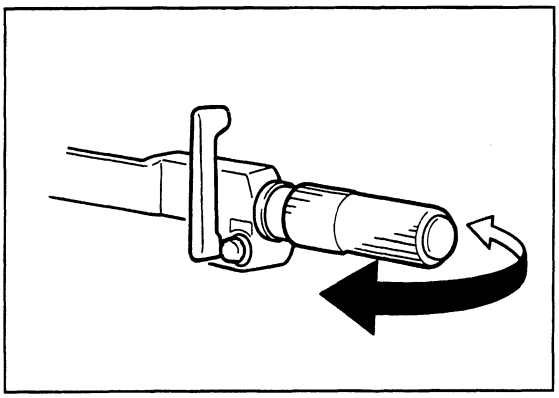
Throttle Control (for Tiller control model)

The throttle control grip is on the tiller handle. Turn the grip counterclockwise to increase speed and clockwise to decrease speed.

Throttle indicator:

The fuel consumption curve on the throttle indicator shows the relative amount of fuel consumed for each throttle position. Choose the setting that offers the best performance and fuel economy for the desired operation.

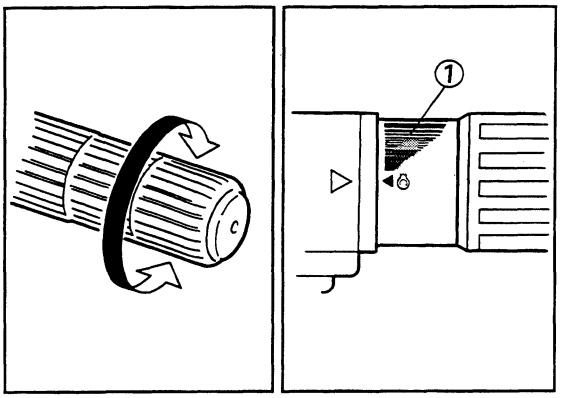
① Throttle indicator



EMD50001

Tiller handle (for Tiller control model)

Moving the tiller handle sideways to adjust the steering angle.



EMD49003

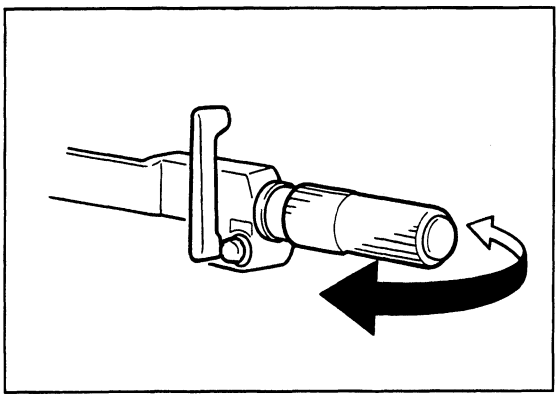
Throttle Control (for Tiller control model)

The throttle control grip is on the tiller handle. Turn the grip counterclockwise to increase speed and clockwise to decrease speed.

Throttle indicator:

The fuel consumption curve on the throttle indicator shows the relative amount of fuel consumed for each throttle position. Choose the setting that offers the best performance and fuel economy for the desired operation.

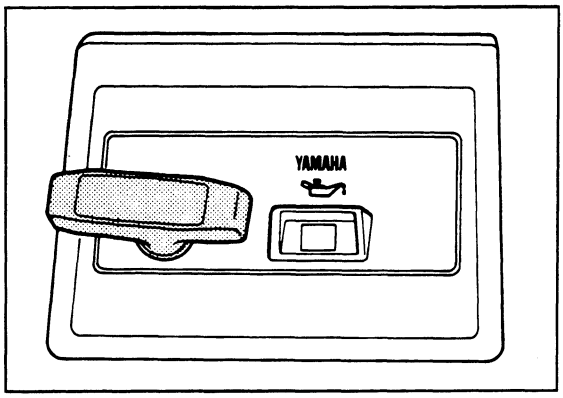
① Throttle indicator



EMD50001

Tiller handle (for Tiller control model)

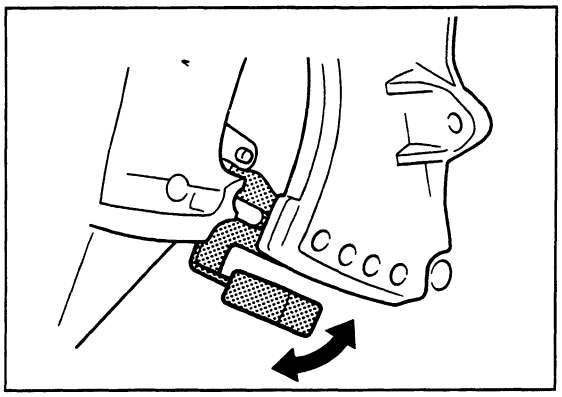
Moving the tiller handle sideways to adjust the steering angle.



EMD51000

Recoil Starter Handle (If equipped)

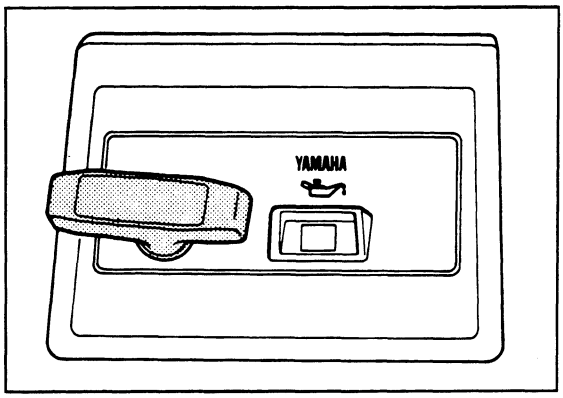
Pull the handle gently until resistance is felt. Then vigorously pull the handle straight out to crank the engine to start it.



EMD52000

Shallow Water Lever (If equipped)

Lifting this lever will tilt the motor up partially to provide more clearance when operating in shallow water.



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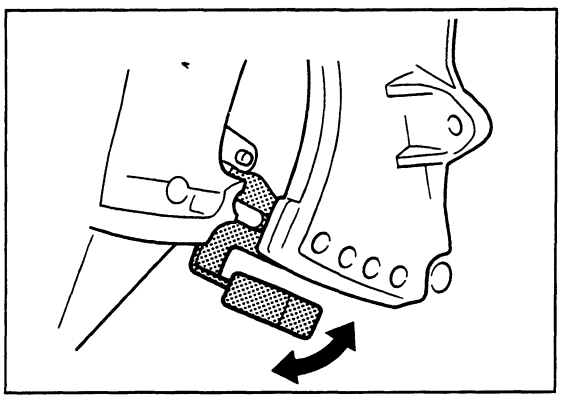

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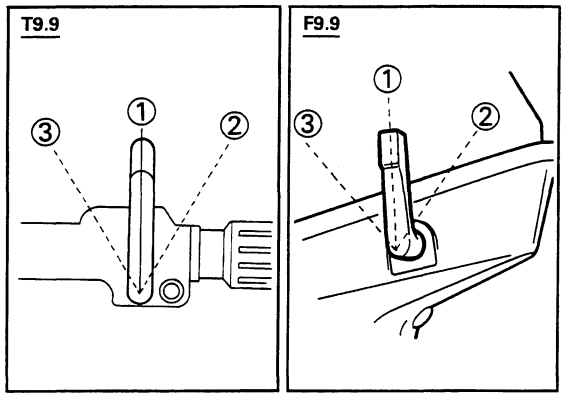
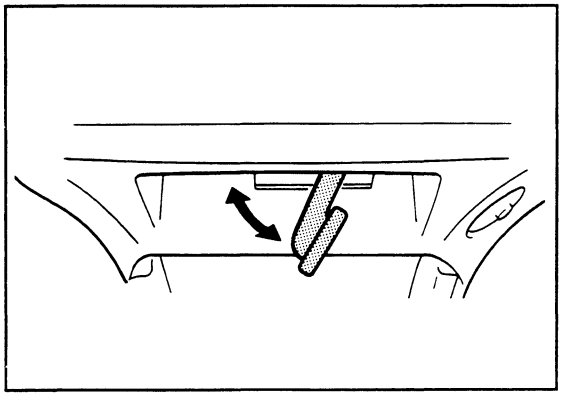


EMD61001

Gear Shift Lever (for Tiller control model)

Turning the gear-shift lever towards you engages the clutch with the forward gear so that the boat moves ahead. Turning the lever away from you engages the reverse gear so that the boat moves astern.

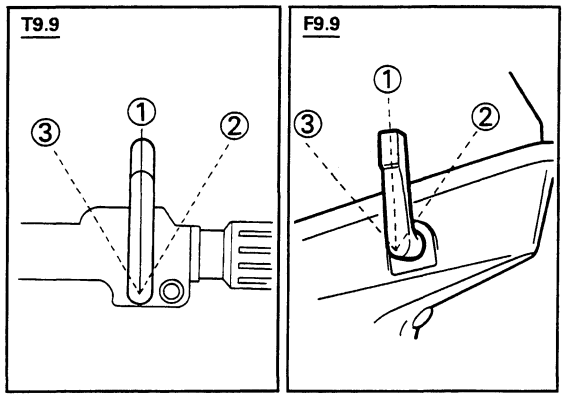
① Neutral
② Forward
③ Reverse



EMD53001

Cowling Lock Lever

To remove the engine top cowling, push the lock lever downward. Then lift off the cowling. When replacing the cowling, check to be sure it fits properly in the rubber seal. Then lock the cowling again by moving the lever upward.



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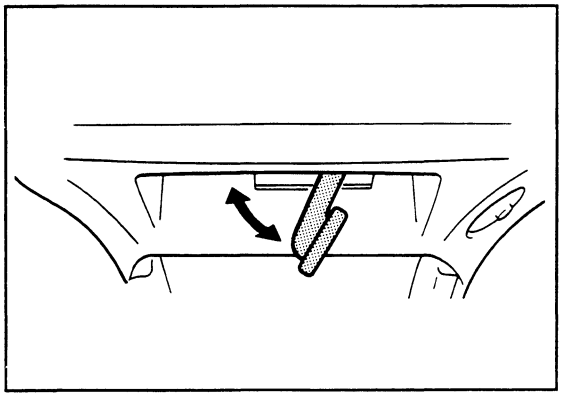

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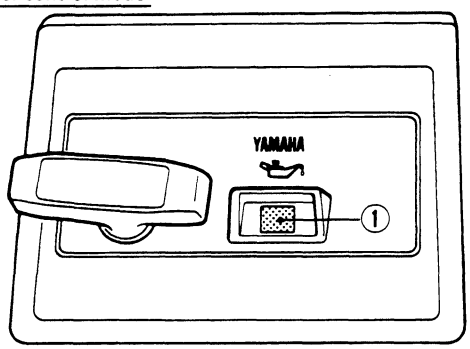
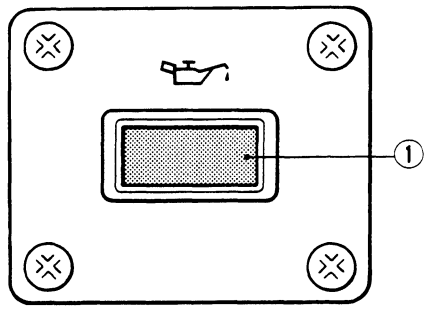


Remote control model



EMD56000

Oil Pressure Indicator

The oil pressure lamp is on when the engine is running and oil pressure is normal.

If oil pressure drops too low, the lamp goes off. As an additional alert of the low oil pressure condition, the engine runs roughly and will not exceed about 2,000 rpm.

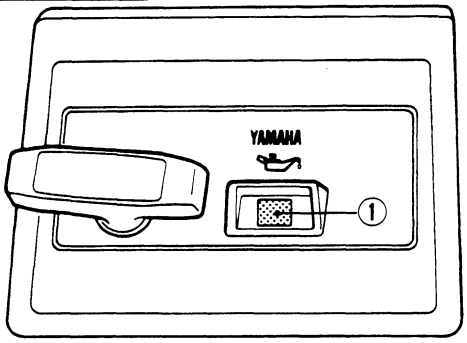
If the oil lamp goes out or does not come on when the engine is running, stop the engine as soon as it is safe to do so. Check oil level and add oil as needed. If the lamp goes off when the oil level is correct, consult your Yamaha dealer.

CAUTION:

Do not continue to run the engine if the oil pressure indicator lamp is off.
Serious engine damage may occur.

① Oil pressure indicator lamp

Tiller control model



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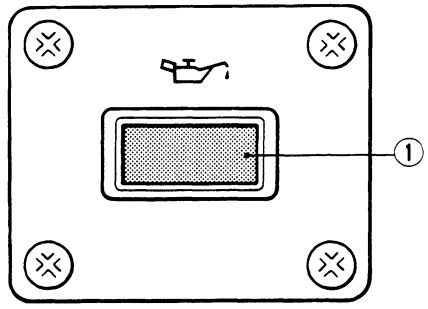

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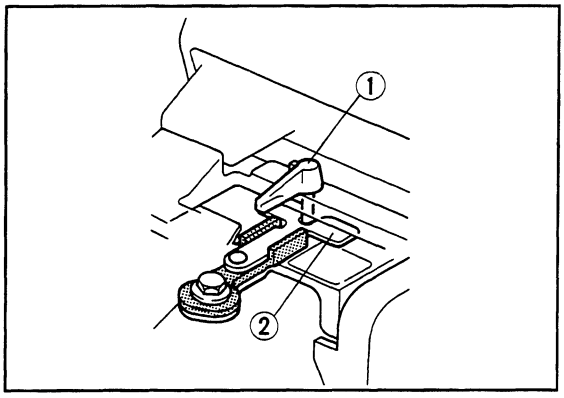


EMD57001

Steering Lock Device

T9.9MH/T9.9EH

A boat with a rudder (such as a sailboat) can be steered with the boat's rudder if the engine is locked in the straight-ahead position. Lock the steering lock lever to the steering lock plate.

① Steering lock lever
② Steering lock plate

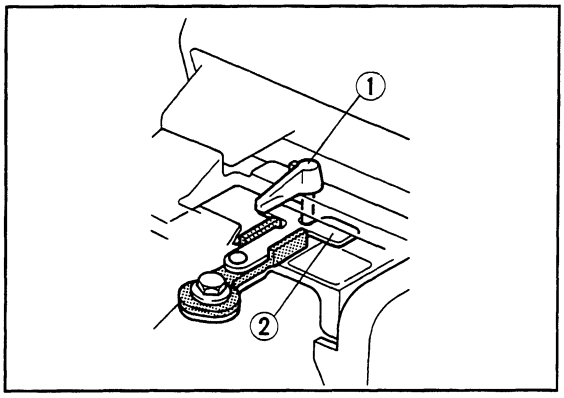
NOTE:

If the sailboat does not move straight ahead when engine is locked with the steering lock lever and the boat's rudder is set straight, readjust the outboard's steering handle angle with the adjustment bolts.

If the engine is forced to turn right or left when the steering is locked, the steering plate is designed to break to protect the outbaord motor. If the plate breaks, remove the screw and replace the plate.

NOTE:

A spare plate is contained in the outboard's original packing.



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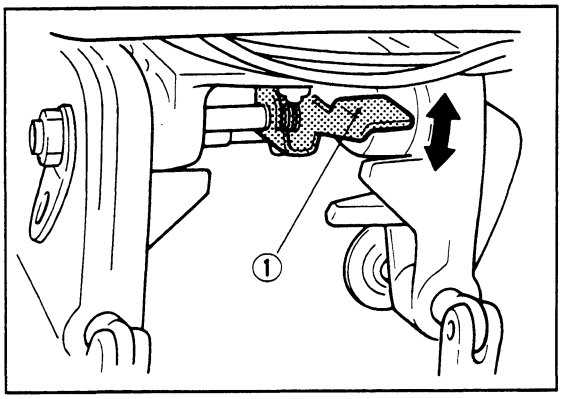
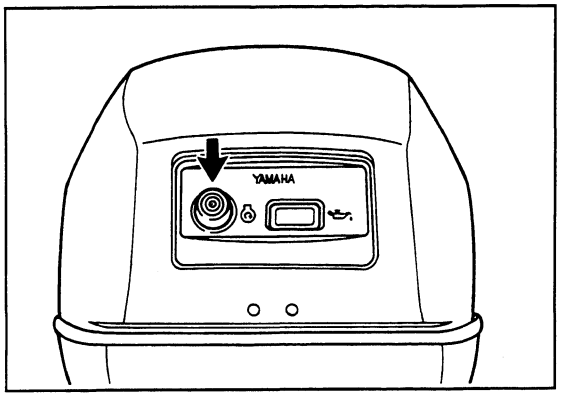


EMD58000

Tilt-lock Mechanism (for Manual tilt model)

The tilt-lock mechanism is used to prevent reverse thrust from the propeller lifting the outboard motor when reversing. To lock it, set the tilt-lock lever in the up position. To release it, push the tilt-lock lever down.

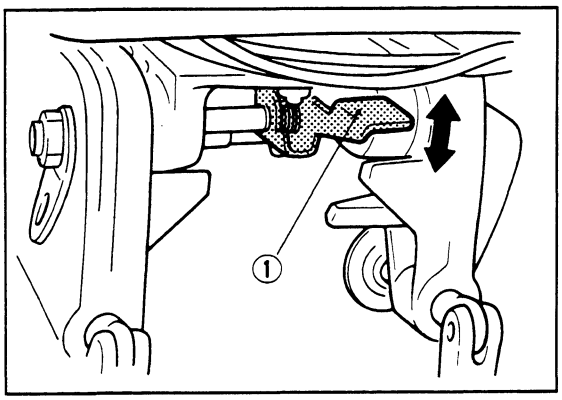
① Tilt-lock lever



EMD59001

Starter Button (for Tiller control model)

When you push the starter button, the electric starter motor cranks the engine to start it.



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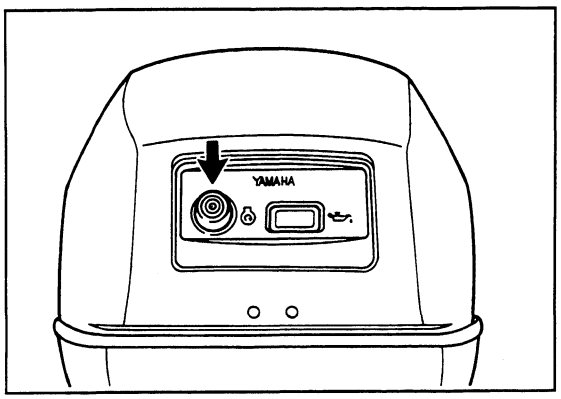

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EMF00201

OPERATION

PRE-OPERATION PROCEDURE

⚠WARNING

If any item in the pre-operation check is not working properly, have it inspected and repaired before operating the outboard motor. Otherwise, an accident could occur.

CAUTION:

Do not start the engine out of water. Overheating and serious engine damage can occur.

Fuel

Check to be sure you have plenty of fuel for your trip. Make sure there are no fuel leaks or gasoline fumes. Check fuel line connections to be sure they are tight.

Be sure the fuel tank is positioned on a secure, flat surface, and that the fuel hose is not twisted or flattened, or likely to contact sharp objects.

Oil

Check the level of the oil in the sump with the dipstick.
If necessary, add oil to bring the level up to the upper mark.

Controls

Check throttle, shift, and steering for proper operation before starting the engine.
The controls should work smoothly, without binding or unusual free play. Look for loose or damaged connections.

Check operation of the starter and stop switches when the outboard moter is in the water.

Engine

Check the engine and engine mounting. Look for loose or damaged fasteners. Check the propeller for damage.

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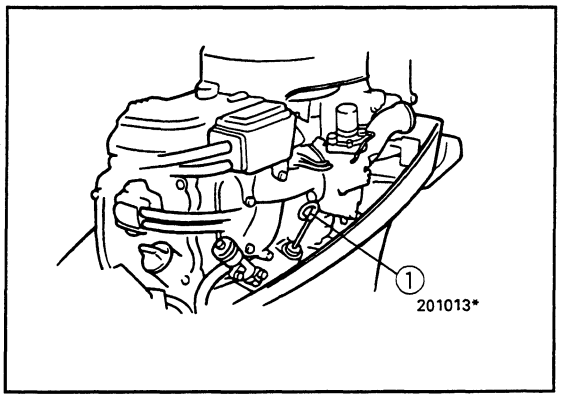
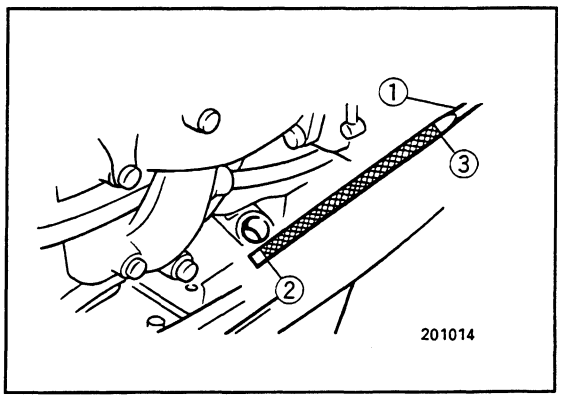
6-1



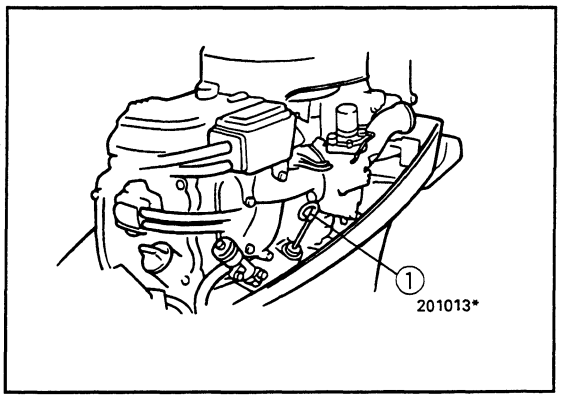
EMF42011

CHECKING THE ENGINE OIL LEVEL

1) Put the outboard motor is in vertical position.
2) Pull out the oil dipstick and wipe off engine oil on it.
3) Insert the dipstick completely and pull out it again.
4) Check the oil level on the dipstick. If the oil level is not between upper and lower level, add oil as necessary. (Refer to "CHANGING ENGINE OIL" section.)



① Oil dipstick
② Lower level mark
③ Upper level mark



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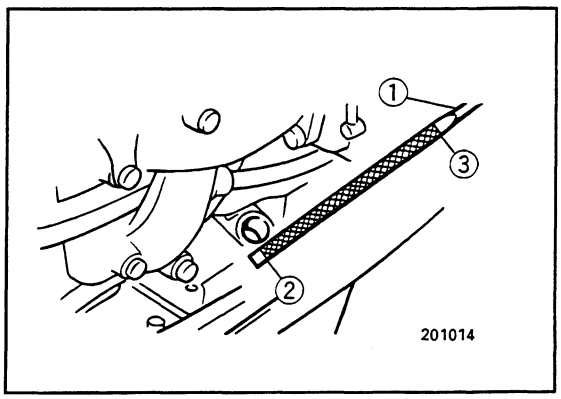

① Oil dipstick
② Lower level mark
③ Upper level mark

6-2

EMF50312

BREAKING IN (RUNNING IN) ENGINE

Your new engine requires a period of break-in (running-in) to allow mating surfaces of moving parts to wear-in evenly. Correct break-in (running-in) will help ensure proper performance and longer engine life.

CAUTION:

Failure to follow the break-in (running-in) procedure may result in reduced engine life or even severe engine damage.

Break-in (running-in) time: 10 hours

EMF53711

Run the engine under load (in gear with a propeller installed) as follows.

1) For the first hour of operation:
   Run the engine at 2,000 r/min or at approximately half throttle.
2) For the second hour of operation:
   Run the engine at 3,000 r/min or at approximately three-quarter throttle, and during this period run it at full throttle for approximately one minute every ten minutes.
3) For the next eight hours of operation:
   Avoid continuous operation at full throttle for more than five minutes at a time.
4) After these first 10 hours:
   Operate the engine normally.

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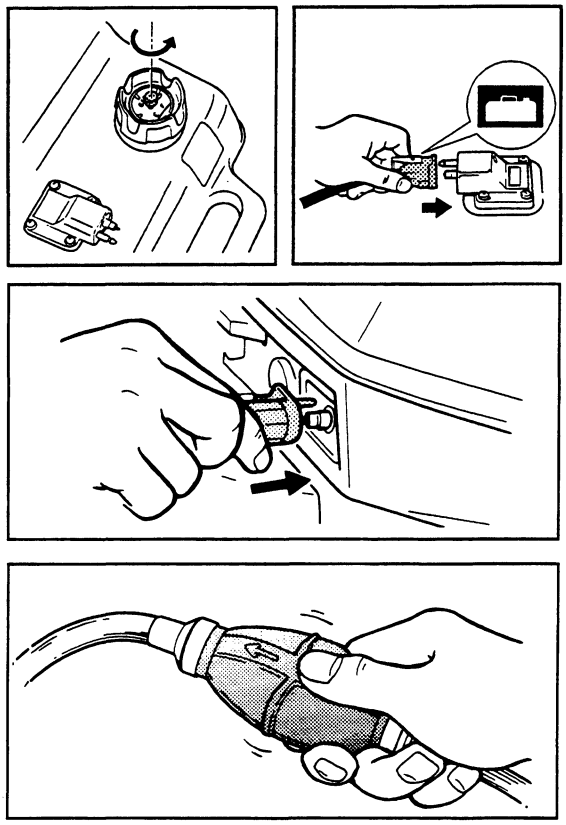


EMU00919*

STARTING ENGINE

⚠WARNING

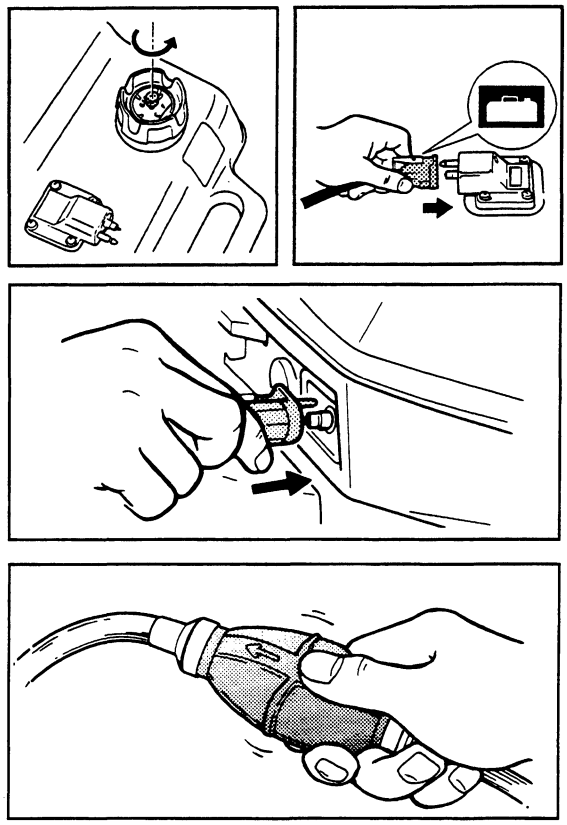
- **Before starting the engine, make sure that the boat is tightly moored and that you can steer clear of any obstructions. Be sure there are no swimmers in the water near you.**
- **When the air-vent screw is loosened, gasoline(petrol) vapor will be released. Gasoline(petrol) is highly flammable, and its vapors are flammable and explosive. Refrain from smoking, and keep away from open flames and sparks while loosening the air-vent screw.**
- **This product emits exhaust gases which contain carbon monoxide, a colorless, odorless gas which may cause brain damage or death when inhaled. Symptoms include nausea, dizziness, and drowsiness. Keep cockpit and cabin areas well ventilated. Avoid blocking exhaust outlets.**

1) If the air vent screw is provided on the fuel tank cap, loosen it 2 or 3 turns.
2) If the fuel joints provided on the motor, firmly connect the fuel joint to the motor. Firmly connect the other joint to the fuel tank.

NOTE:

During engine operation place the tank horizontally, or fuel could not be sucked.

3) Squeeze the primer bulb with the outlet end up until you feel it become firm.



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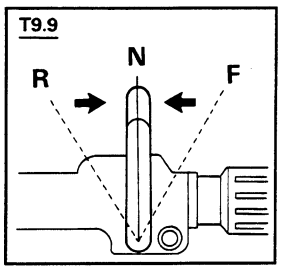
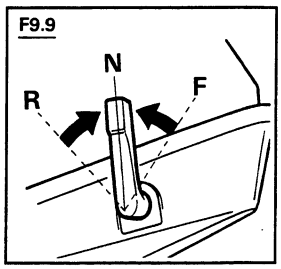
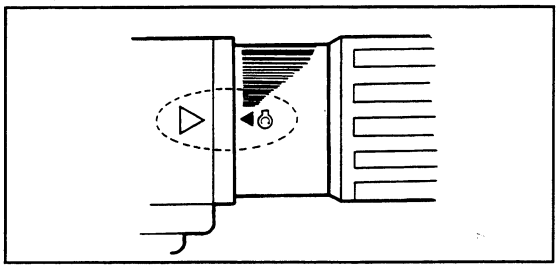
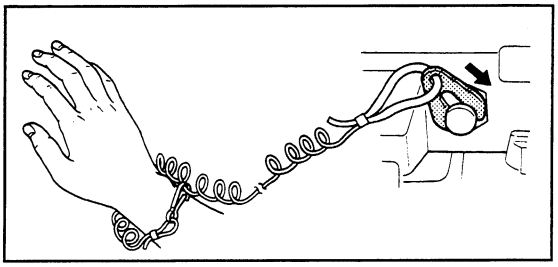








Procedure for tiller control model

4) Place the gear-shift lever in the Neutral position.

NOTE:

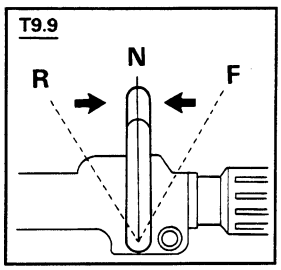
The start-in-gear protection device permits the engine to be started only when it is in Neutral.

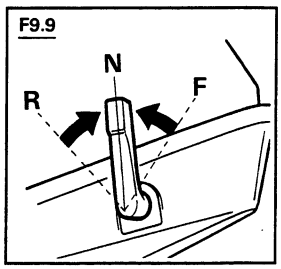
5) Place the throttle control grip in the "START" position.

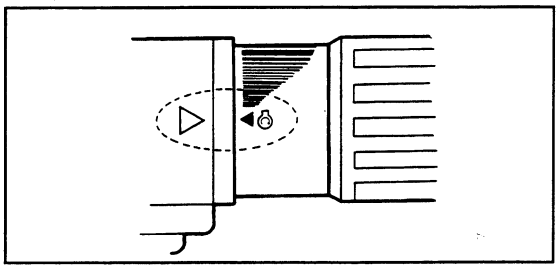
6) Attach the engine stop switch lanyard to a secure place on your clothing, or your arm or leg. Then, install the lock plate on the other end of the lanyard in the engine stop switch.

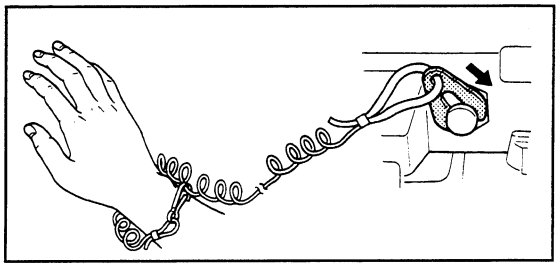
⚠WARNING

- **Attach the engine stop switch lanyard to a secure place on your clothing, your arm or leg while operating.**
- **Do not attach the lanyard to clothing that could tear loose. Do not route the lanyard where it could become entangled, preventing it from functioning.**
- **Avoid accidentally pulling the lanyard during normal operation. Loss of engine power means the loss of most streering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.**









Procedure for tiller control model

4) Place the gear-shift lever in the Neutral position.

NOTE:

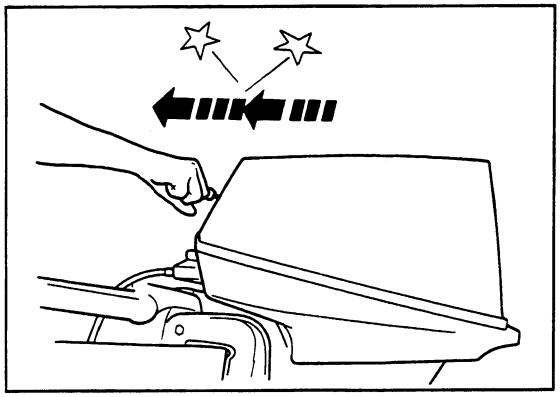
The start-in-gear protection device permits the engine to be started only when it is in Neutral.

5) Place the throttle control grip in the "START" position.

6) Attach the engine stop switch lanyard to a secure place on your clothing, or your arm or leg. Then, install the lock plate on the other end of the lanyard in the engine stop switch.

⚠WARNING

- **Attach the engine stop switch lanyard to a secure place on your clothing, your arm or leg while operating.**
- **Do not attach the lanyard to clothing that could tear loose. Do not route the lanyard where it could become entangled, preventing it from functioning.**
- **Avoid accidentally pulling the lanyard during normal operation. Loss of engine power means the loss of most streering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.**



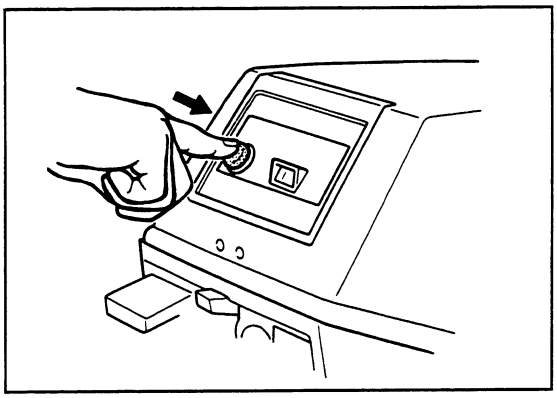
Manual start model

7) To start the engine, pull the starter handle slowly until you feel resistance. Then, give a strong pull straight out to crank the engine.

NOTE:

If the engine fails to start on the first pull, repeat the above procedure. If the engine still will not start after several attempts, refer to the section on troubleshooting.

8) After the engine starts, do not let go of the starter handle. Return it slowly to its home position before releasing it.

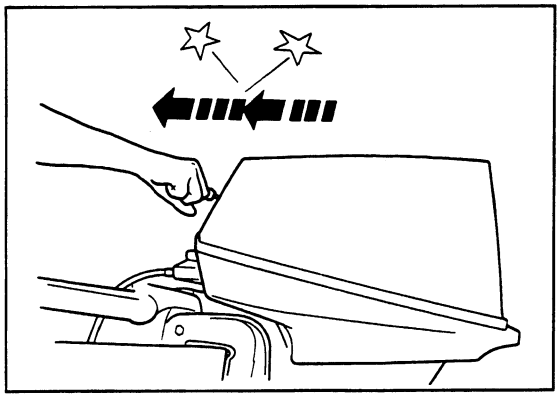


Electric start model

7) Push the starter-switch to start the starting motor.
8) Immediately the engine starts, release the starter-switch to return it to its home position.

CAUTION:

- **Do not push the starter-button when the engine is running.**
- **Do not keep the starter-motor turning for more than 5 seconds. If the engine does not start within 5 seconds, release your hand from starter-switch, wait 10 seconds, and then crank the engine again. (If the starter-motor is run continuously for more than 5 seconds, the battery will rapidly become exhausted and it will be impossible for it to start the engine.)**



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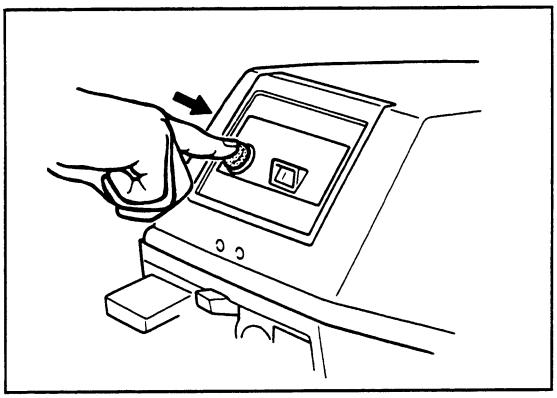

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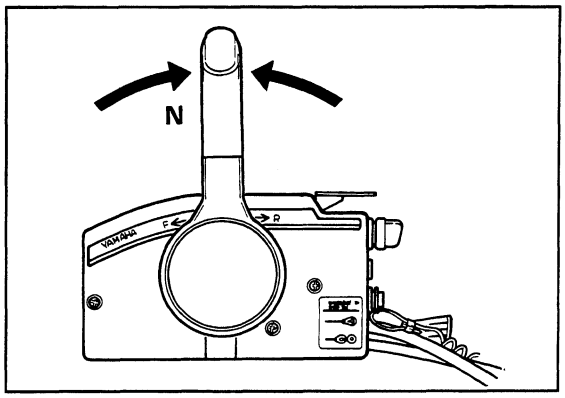
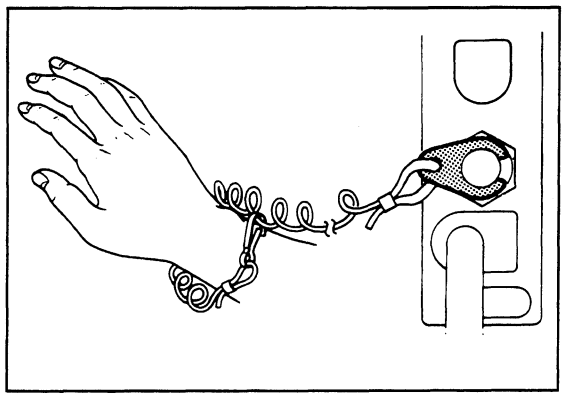
6-6





Procedure for remote control model

4) Place the remote control lever in the Neutral position.

NOTE:

- The start-in-gear protection device prevents the engine from starting except when in Neutral.
- It is not necessary to open the free accelerator lever or Neutral throttle lever while starting.

5) Attach the engine stop switch lanyard to a secure place on your clothing, or your arm or leg. Then, install the lock plate on the other end of the lanyard in the engine stop switch.

⚠WARNING

- **Attach the engine stop switch lanyard to a secure place on your clothing, your arm or leg while operating.**
- **Do not attach the lanyard to clothing that could tear loose. Do not route the lanyard where it could become entangled, preventing from functioning.**
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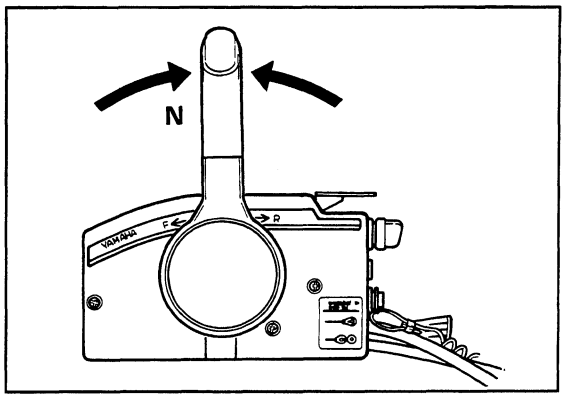

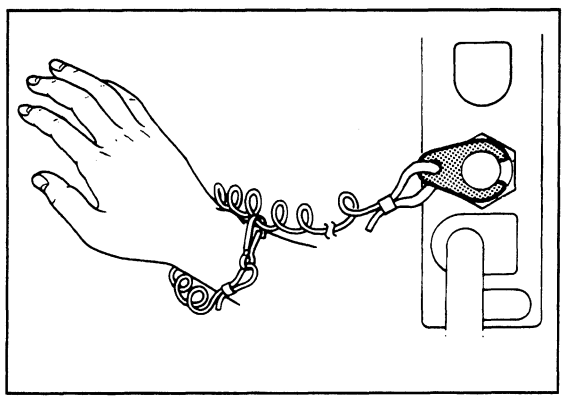

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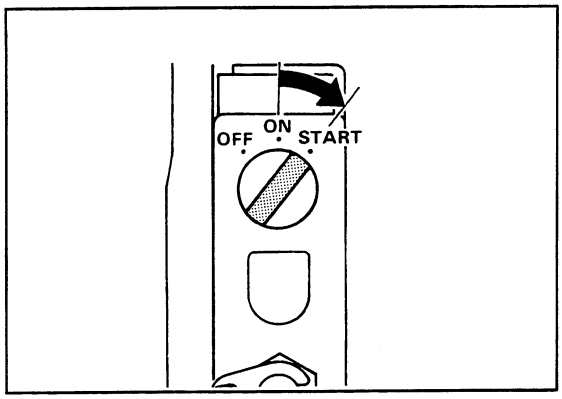
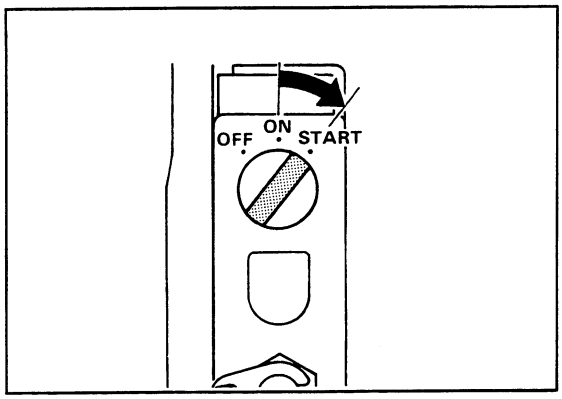


6) Turn the main switch to "ON".
7) Turn the main switch to "START", and hold it for a maximum of 5 seconds.
8) Immediately the engine starts, release the main switch to return it to "ON".

CAUTION:

- **Do not turn the main switch to "START" when the engine is running.**
- **Do not keep the starter-motor turning for more than 5 seconds with the main switch in the "START" position. If the engine does not start within 5 seconds, return the main switch to "ON", wait 10 seconds, and then crank the engine again. (If the starter-motor is run continuously for more than 5 seconds, the battery will rapidly become exhausted and it will be impossible for it to start the engine.)**



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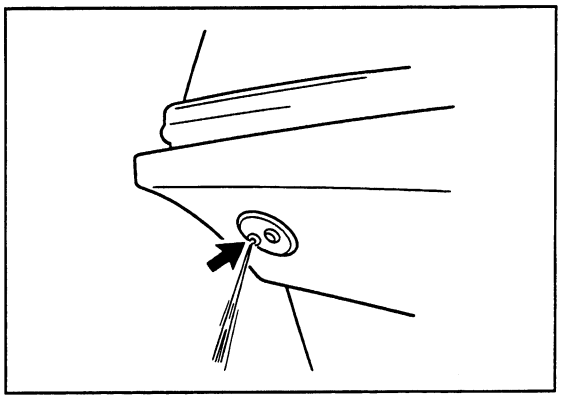
6-8



EMG00300

WARMING UP ENGINE

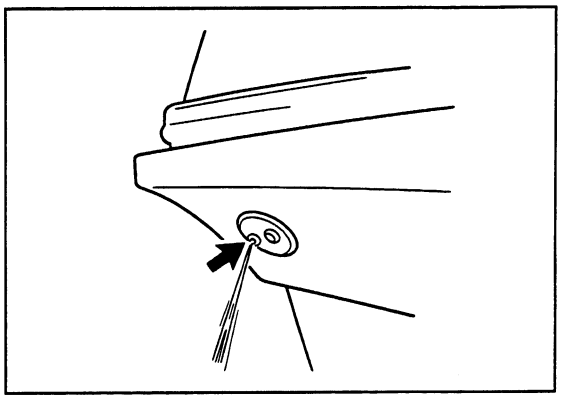
1) Before beginning operation, allow the engine to warm up at idling speed for 3 minutes. (Failure to do this will shorten engine life.)
2) Check for a steady flow of water from the cooling-water pilot holes.

If the engine has been stored for a long period:

If the engine does not accelerate smoothly after warming up, the accelerator pump of the carburetor may not be getting enough fuel. Put the engine in Neutral, then repeatedly open and close the throttle several times until the engine runs smoothly.

CAUTION:

A continuous flow of water from the pilot hole shows that the water pump is pumping water through the cooling passages. If water is not flowing out of the pilot hole at all times while the engine is running, do not continue to run the engine. Overheating and serious damage could occur. Stop the engine and check to see if the water inlet on the lower casing is blocked. If the problem cannot be found and corrected, consult your Yamaha dealer.



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EMG30701

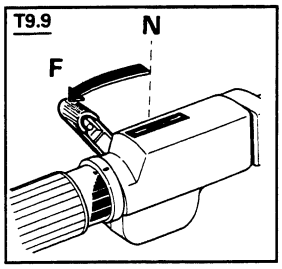
SHIFTING

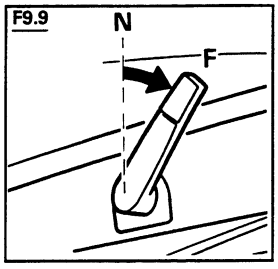
⚠WARNING

Before shifting, make sure there are no swimmers or obstacles in the water near you.

CAUTION:

To change the shifting position from forward to reverse or vice-versa, close the throttle first so that the engine idles (or runs at low speeds).

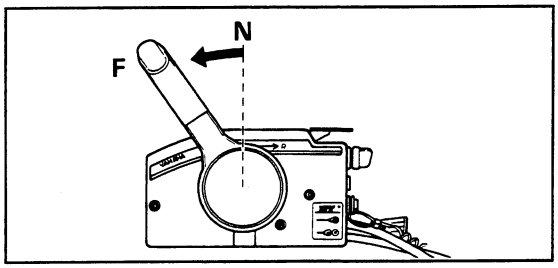




Forward

Tiller control model

1) Place the throttle control grip in the fully closed position.
2) Turn the gear-shift lever quickly and firmly from Neutral to Forward.



Remote control model

Pull up the neutral interlock trigger and move remote control lever quickly and firmly from Neutral to Forward.

EMG30701

SHIFTING

⚠WARNING

Before shifting, make sure there are no swimmers or obstacles in the water near you.

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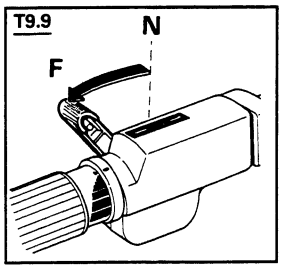
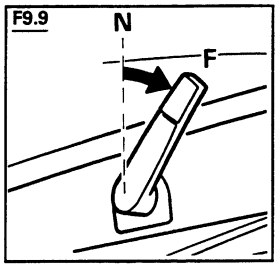
To change the shifting position from forward to reverse or vice-versa, close the throttle first so that the engine idles (or runs at low speeds).





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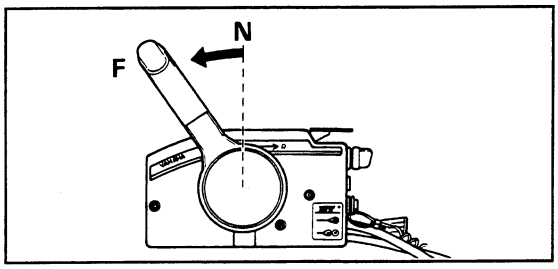

Remote control model

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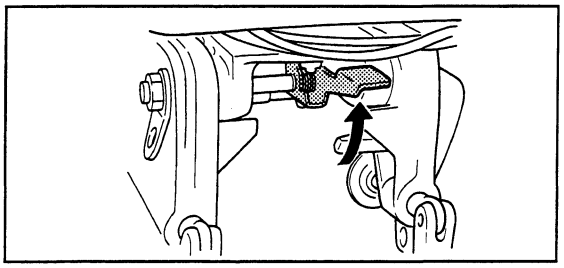
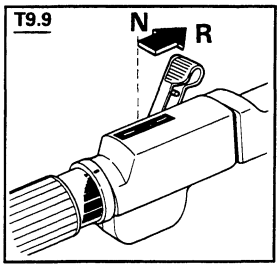
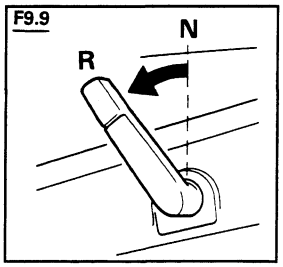
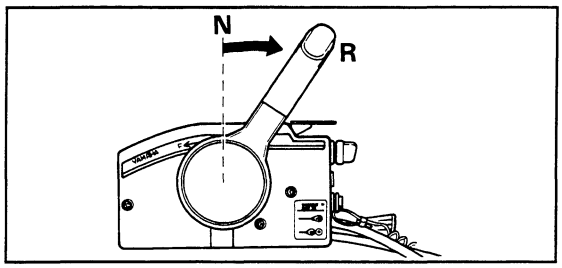








Reverse

⚠WARNING

When operating in Reverse, go slowly. Do not open the throttle more than half. Otherwise, the boat may become unstable, which could result in loss of control and an accident.

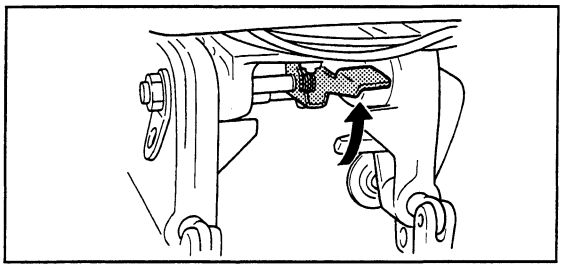
1) Place the throttle control grip in the fully closed position (for Tiller control model).
2) Check that the tilt-lock lever (for Manual tilt model) is in the locked position.

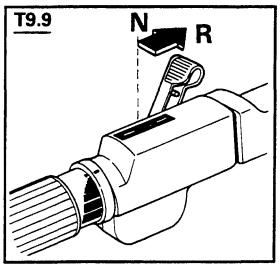
Tiller control model

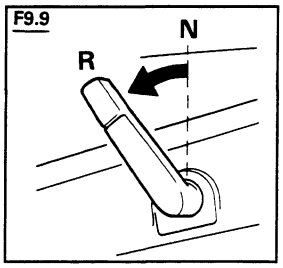
3) Turn the gear-shift lever quickly and firmly from Neutral to Reverse.

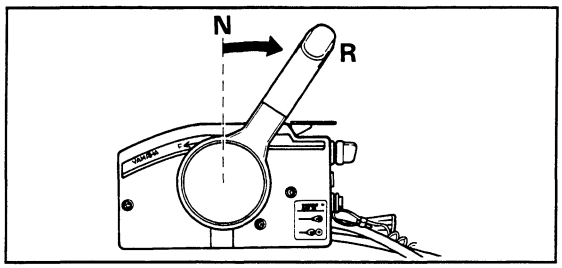
Remote control model

3) Pull up the neutral interlock trigger and move the remote control lever quickly and firmly from Neutral to Reverse.









Reverse

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When operating in Reverse, go slowly. Do not open the throttle more than half. Otherwise, the boat may become unstable, which could result in loss of control and an accident.

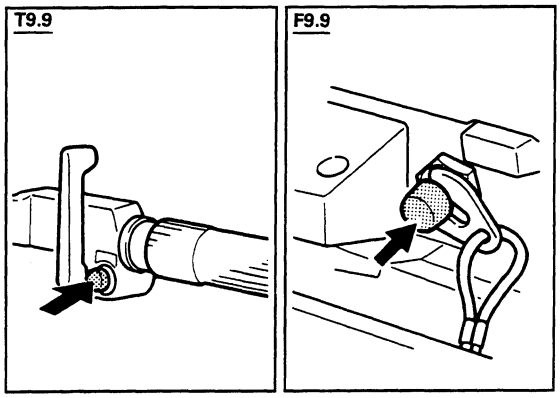
1) Place the throttle control grip in the fully closed position (for Tiller control model).
2) Check that the tilt-lock lever (for Manual tilt model) is in the locked position.

Tiller control model

3) Turn the gear-shift lever quickly and firmly from Neutral to Reverse.

Remote control model

3) Pull up the neutral interlock trigger and move the remote control lever quickly and firmly from Neutral to Reverse.



EMG38010

STOPPING ENGINE

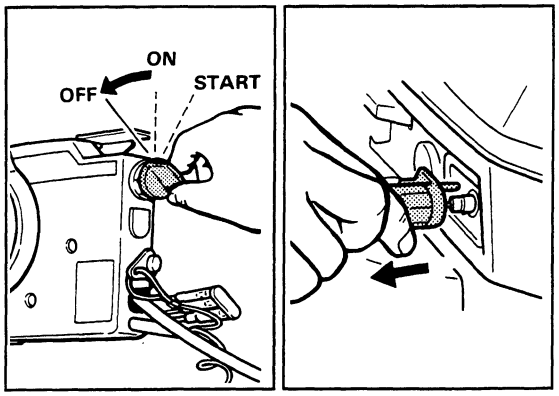
Let it cool off for a few minutes at idle or low speed first. Stopping the engine immediately after operating at high speed is not recommended.

EMG41311

Procedure

Tiller control model

1) Push and hold the engine stop switch (If button switch equipped on the switch) the engine comes to a complete stop.

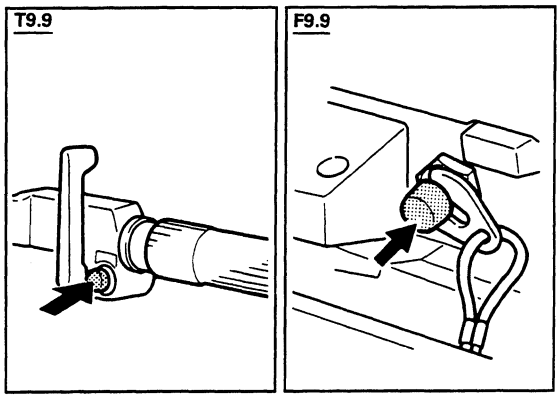


Remote control model

1) Turn the main switch to "OFF".
2) After stopping the engine, disconnect the fuel line from the motor.
3) Tighten the air vent screw on the fuel tank cap after stopping the engine, if it is equipped.
4) Remove the key if the boat will be left unattended.

NOTE:

The engine can be stopped by pulling the lanyard from the engine stop lanyard switch. If the main switch is equipped, turn the main switch to "OFF".



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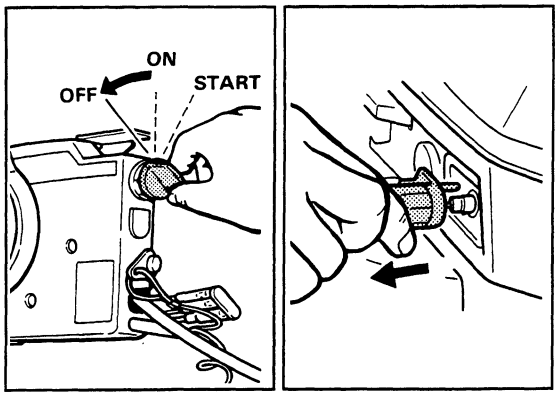

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EMH00203

TRIMMING OUTBOARD MOTOR

The trim angle of the outboard motor helps determine the position of the bow of the boat in the water. The correct trim angle will help improve performance and fuel economy while reducing strain on the engine. The correct trim angle depends upon the combination of boat, engine, and propeller. Correct trim is also affected by variables such as the load in the boat, sea conditions, and running speed.

⚠WARNING

Excessive trim for the operating conditions (either trim up or trim down) can cause boat instability and can make steering the boat more difficult. This increases the possibility of an accident. If the boat begins to feel unstable or is hard to steer, slow down and/or readjust the trim angle.

EMG61011

Adjusting trim angle

There are 4 or 5 holes provided in the clamp bracket to adjust the outboard motor trim angle.

1) Stop the engine.
2) Remove the trim angle adjusting rod from the clamp bracket while tilting the motor up slightly.
3) Reposition the rod in the desired hole.

To raise the bow ("trim-out"), move the rod away from the transom.

To lower the bow ("trim-in"), move the rod toward the transom.

Make test runs with the trim set to different angles to find the position that works best for your boat and operating conditions.

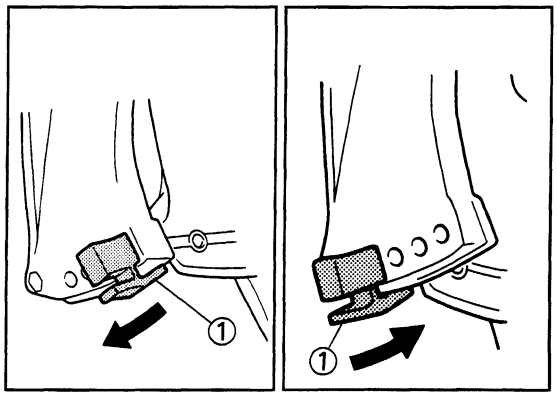
① Trim angle adjusting rod

⚠WARNING

- **Stop the engine before adjusting the trim angle.**
- **Use care to avoid being pinched when removing or installing the rod.**
- **Use caution when trying a trim position for the first time. Increase speed gradually and watch for any signs of instability or control problems. Improper trim angle can cause loss of control.**

NOTE:

The outboard motor trim angle can be changed approximately 4 degrees by shifting the trim adjusting-rod one hole.



EMH00203

TRIMMING OUTBOARD MOTOR

The trim angle of the outboard motor helps determine the position of the bow of the boat in the water. The correct trim angle will help improve performance and fuel economy while reducing strain on the engine. The correct trim angle depends upon the combination of boat, engine, and propeller. Correct trim is also affected by variables such as the load in the boat, sea conditions, and running speed.

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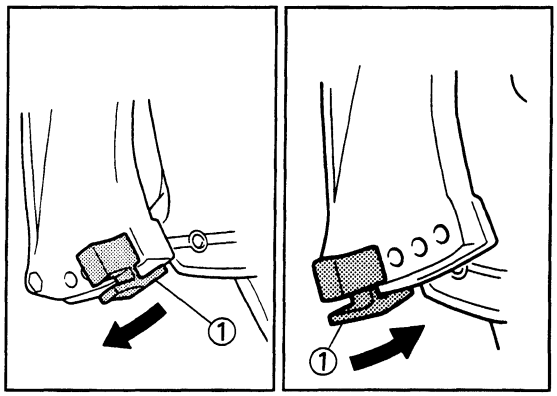
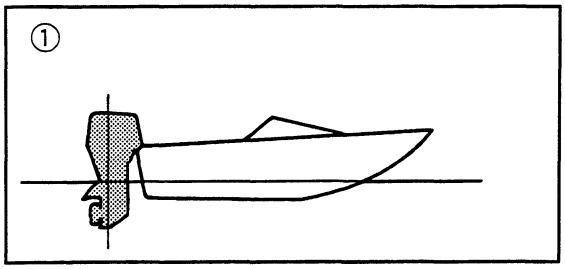
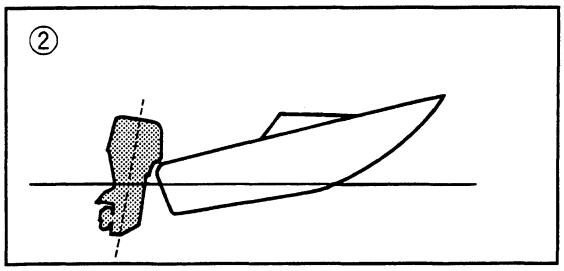
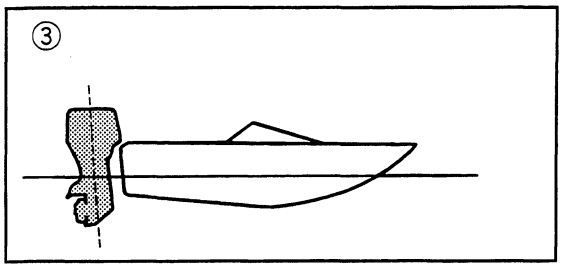








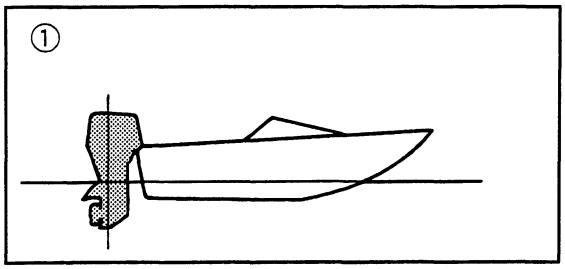
Bow up
When the boat is on plane, a bow-up attitude result in less drag, greater stability and efficiency. This is generally when the keel line of the boat is up about 3 to 5 degrees. When trimmed out, the boat may have more tendency to steer to one side or the other. Compensate for this as you steer. The trim tab can also be adjusted to help offset this effect.

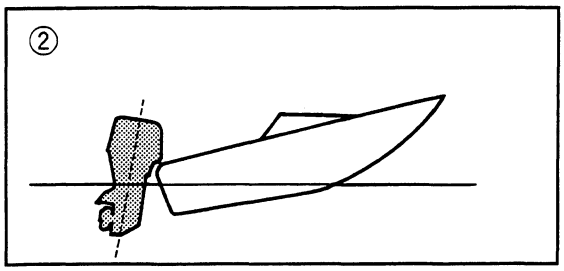
Too much trim-out puts the bow of the boat too high in the water. Performance and economy are decreased because the hull of the boat is pushing the water and there is more air drag.
Excessive trim-up can cause the propeller to ventilate, which reduces performance further. When trimmed-out too much, a boat may "porpoise" (jump in rough water), which could throw the operator and passengers overboard.

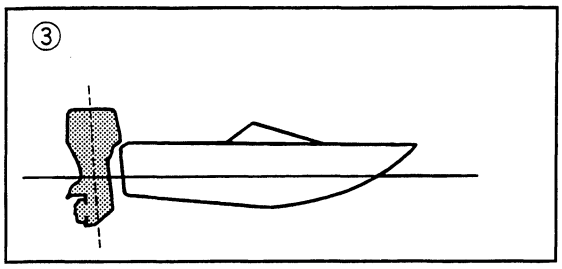
Bow down
When the bow of the boat is down, it is easier to accelerate from a standing start onto plane.

Too much trim-in causes the boat to "plow" through the water, decreasing fuel economy and making it hard to increase speed.
Operating with excessive trim-in at higher speeds also makes the boat unstable. Resistance at the bow is greatly increased, heightening the danger of "bow steering" and making operation difficult and dangerous.

① Optimum angle
② Bow up
③ Bow down







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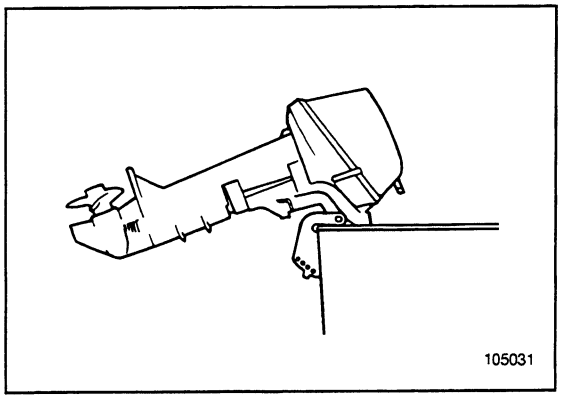
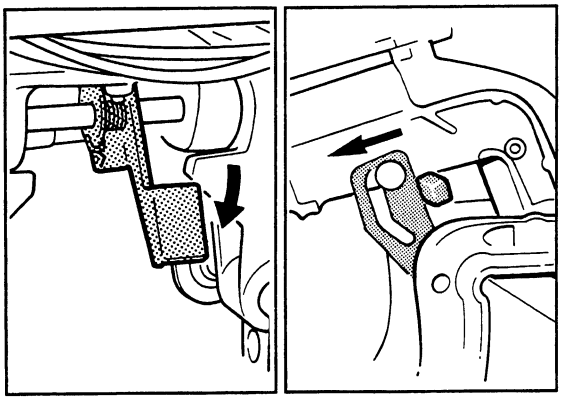
6-14





TILTING UP/DOWN (for Manual tilt model)

If the engine will be stopped for some time, or if the boat is moored in shallows, the engine should be tilted up to protect the propeller and casing from damage by collision with obstructions, and also to reduce salt corrosion.

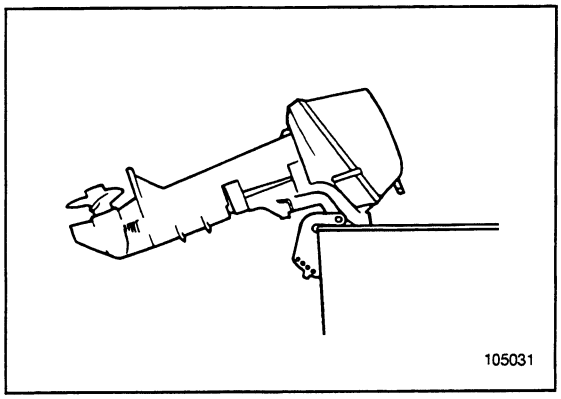
CAUTION:

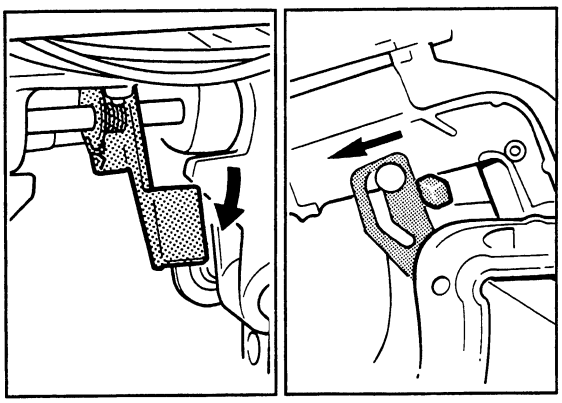
- **Before tilting the motor, follow the procedures under STOPPING ENGINE. Never tilt the motor while the engine is running. Severe damage from overheating can result.**
- **Do not tilt up the engine by pushing the steering handle as this could break the handle.**
- **Keep the power unit higher than the propeller at all times. Otherwise, water can run into the cylinder, causing damage.**

1) Remove the fuel-line connection from the motor.
2) Push the tilt-lock lever down to release.
3) Hold the rear of the top cowling with one hand, tilt the engine up, and lock the tilt-support knob to the swivel bracket with the other hand.

⚠WARNING

Leaking fuel is a fire hazard.
Disconnect the fuel line if the engine will be tilted for more than a few minutes. Otherwise, fuel may leak.





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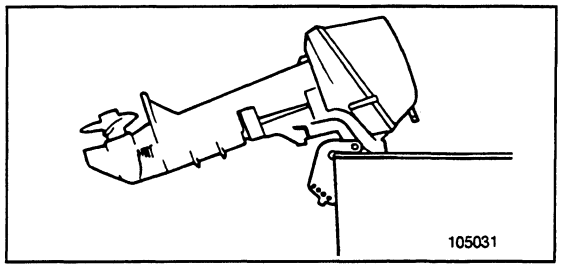
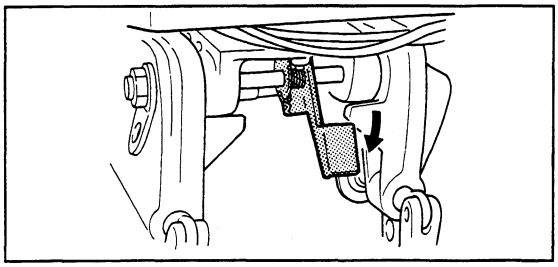
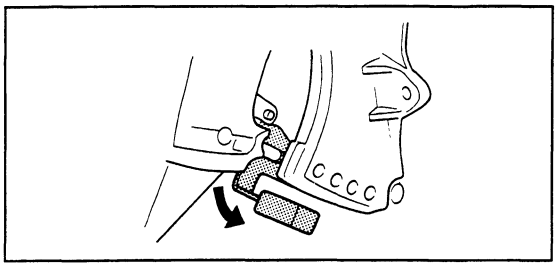
6-15







EMH60200

CRUISING IN SHALLOW WATER (If equipped)

The engine can be tilted up partially to allow operation in shallow water.

⚠WARNING

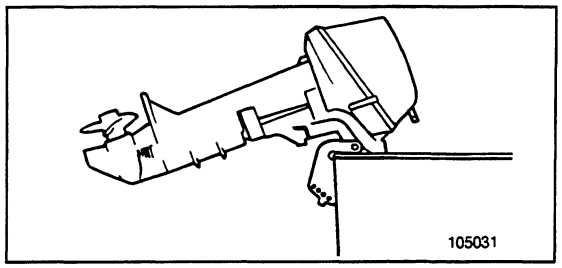
- **Place the gear shift in the Neutral position before using the shallow water lever.**
- **Run the boat at the lowest possible speed when using the shallow water lever. The tilt-lock mechanism does not work when the shallow water lever is being used. Hitting an underwater obstacle could cause the engine to lift out of the water, resulting in loss of control.**
- **Use extra care when operating in reverse. Too much reverse thrust can cause the engine to lift out of the water, increasing the chance of accident and personal injury.**
- **Return the engine to its normal position as soon as the boat is back in deeper water.**

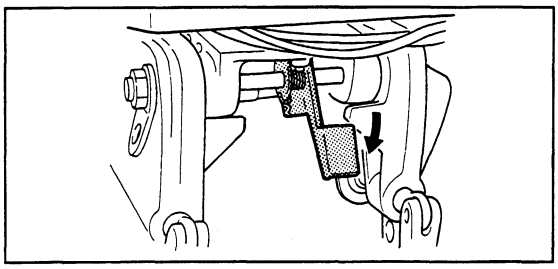
CAUTION:

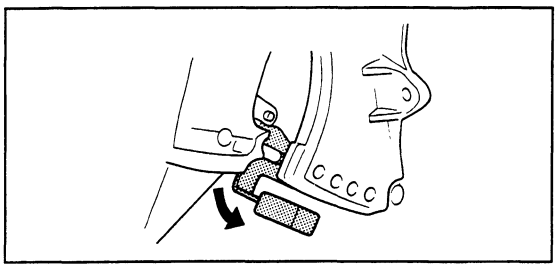
Place the gear-shift in the Neutral position before using the shallow water lever.

To cruise in shallows, proceed as follows:

1) Push the tilt-lock lever down to the release position.
2) Slightly tilt up the engine and pull the shallow water lever toward the transom.







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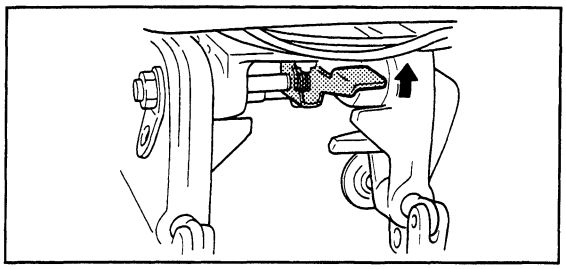


3) To return the engine to the normal position, put the engine in Neutral, then slightly tilt up the engine. Set the tilt-lock lever to the lock position and slowly tilt the engine down.

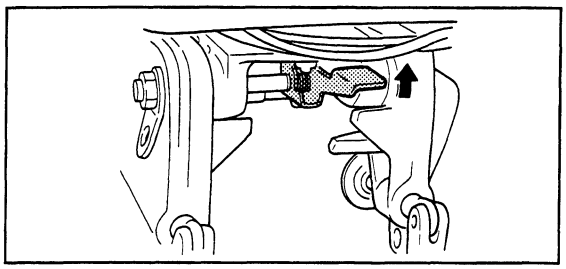
EMH80000

CRUISING IN SALT WATER

After operating in salt water, wash out the cooling-water passages with fresh water to prevent them from becoming clogged-up with salt deposits (See flushing instructions, page 8-3).

CRUISING IN TURBID WATER

It is strongly recommended that the optional chromium-plated water-pump kit be installed if the outboard is to be used in turbid (muddy) water conditions.



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RULES OF THE ROAD

Just as there are rules which apply when you are driving on streets and high ways, there are waterway rules which apply when you are driving your boat. These rules are used internationally, and are also enforced by the United States Coast Guard and local agencies. You should be aware of these rules, and follow them whenever you encounter another vessel on the water.

Several sets of rules prevail according to geographic location, but are all basically the same as the International Rules of the Road. The rules presented here in your Owner's Manual are condensed, and have been provided for your convenience only. Consult your local U.S. Coast Guard Auxiliary or Department of Motor Vehicles for a complete set of rules governing the waters in which you will be using your boat.

STEERING AND SAILING RULES AND SOUND SIGNALS

Whenever two vessels on the water meet one another, one vessel has the right-of-way; it is called the "stand-on" vessel. The vessel which does not have the right-of-way is called the "give-way" or "burdened" vessel. These rules determine which vessel has the right-of-way, and what each vessel should do.

Stand-on vessel
The vessel with the right-of-way has the duty to continue its course and speed, except to avoid an immediate collision. When you maintain your direction and speed, the other vessel will be able to determine how best to avoid you.

Give-way vessel
The vessel which does not have the right-of-way has the duty to take positive and timely action to stay out of the way of the Stand-On vessel. Normally, you should not cross in front of the vessel with the right-of-way. You should slow down or change directions briefly and pass behind the other vessel. You should always move in such a way that the operator of the other vessel can see what you are doing.

"The general prudential rule"
This rule is called Rule 2 in the International Rules and says,

> 'In obeying and construing these rules due regard shall be had to all dangers of navigation and collision, and to any special circumstances, which may render a departure from the above rules necessary in order to avoid immediate danger.'

In other words, follow the standard rules except when a collision will occur unless both vessels try to avoid each other. If that is the case, both vessels become "Give-Way" vessels.

EMJ00000

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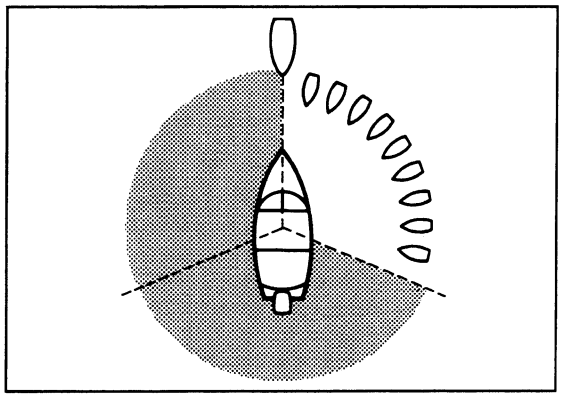
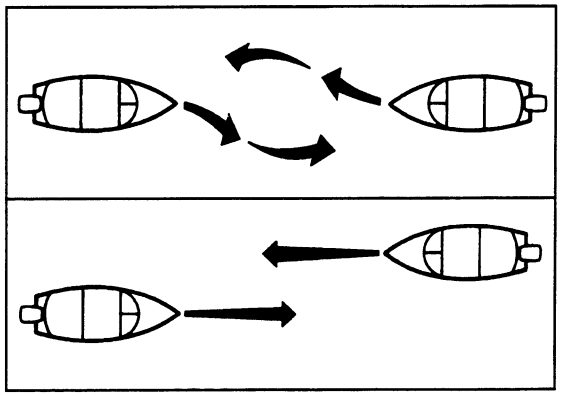




RULES WHEN ENCOUNTERING VESSELS

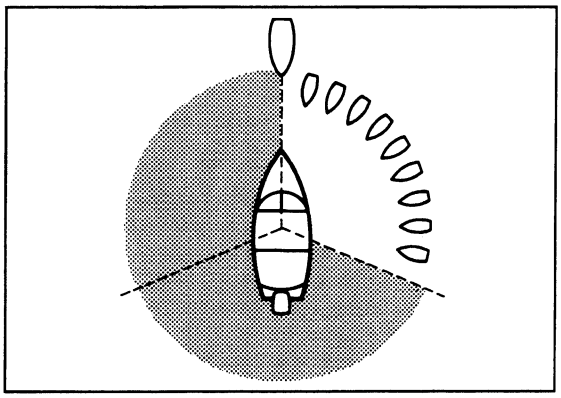
There are three main situations which you may encounter with other vessels which could lead to a collision unless the Steering Rules are followed:

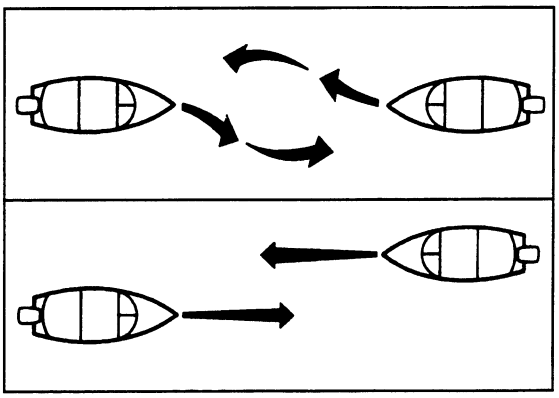
Meeting (you are approaching another vessel head-on)
Crossing (you are travelling across the other vessel's path)
Overtaking (you are passing or being passed by another vessel)

In the following illustration, your boat is in the center. You should give the right-of-way to any vessels shown in white area (you are the Give-Way vessel). Any vessels in the shaded area must yield to you (they are the Give-Way vessels). Both you and the meeting vessel must alter course to avoid each other.

Meeting

If you are meeting another power vessel head on, and are close enough to run the risk of collision, neither of you has the right-of-way! Both of you should alter course to avoid an accident. You should keep the other vessel on your port (left) side. This rule doesn't apply if both of you will clear one another if you continue on your set course and speed.





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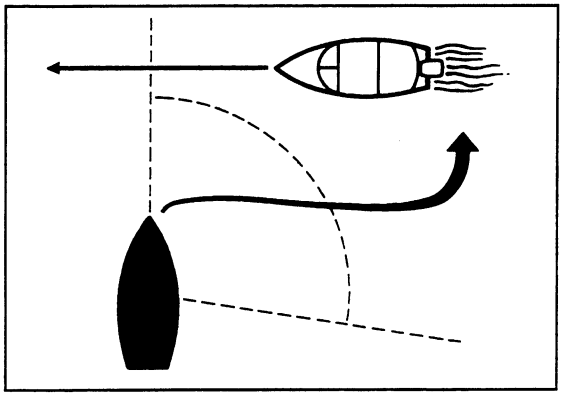
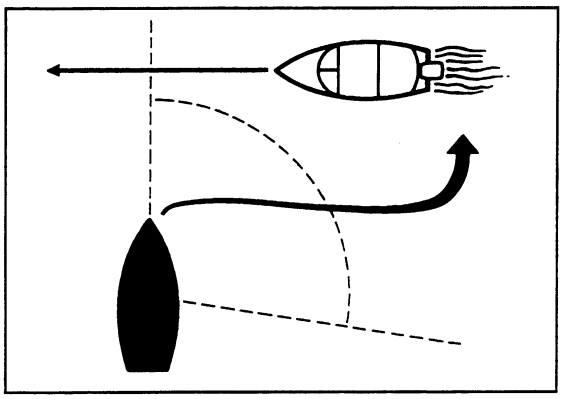


Crossing

When two power driven vessels are crossing each other's path close enough to run the risk of collision, the vessel which has the other on the starboard (right) side must keep out of the way of the other. If the other vessel is on your right, you must keep out of its way; you are the Give-Way vessel. If the other vessel is on your port (left) side, remember that you should maintain course and direction, provided the other vessel gives you the right-of-way as it should.

Overtaking

If you are passing another vessel, you are the "Give-Way" vessel. This means that the other vessel is expected to maintain its course and speed. You must stay out of its way until you are clear of it. Likewise, if another vessel is passing you, you should maintain your speed and direction so that the other vessel can steer itself around you.



Crossing

When two power driven vessels are crossing each other's path close enough to run the risk of collision, the vessel which has the other on the starboard (right) side must keep out of the way of the other. If the other vessel is on your right, you must keep out of its way; you are the Give-Way vessel. If the other vessel is on your port (left) side, remember that you should maintain course and direction, provided the other vessel gives you the right-of-way as it should.

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OTHER SPECIAL SITUATIONS

There are three other rules you should be aware of when driving your boat around other vessels.

Narrow channels and bends

When navigating in narrow channels, you should keep to the right when it is safe and practical to do so. If the operator of a power-driven vessel is preparing to go around a bend that may obstruct the view of other water vessels, the operator should sound a prolonged blast on the whistle (4 to 6 seconds). If another vessel is around the bend, it too should sound the whistle. Even if no reply is heard, however, the vessel should still proceed around the bend with caution. If you navigate such waters with your boat, you will need to carry a portable air horn, available from local marine supply stores.

Fishing vessel right-of-way

All vessels which are fishing with nets, lines or trawls are considered to be "fishing vessels" under the International Rules. Vessels with trolling lines are not considered fishing vessels. Fishing vessels have the right-of-way regardless of position. Fishing vessels cannot, however, impede the passage of other vessels in narrow channels.

Sailing vessel right-of-way

Sailing vessels should normally be given the right-of-way. The exceptions to this are:

1. When the sailing vessel is overtaking the power-driven vessel, the power-driven vessel has the right-of-way.
2. Sailing vessels should keep clear of any fishing vessel.
3. In a narrow channel, a sailing vessel should not hamper the safe passage of a power-driven vessel which can navigate only in such a channel.

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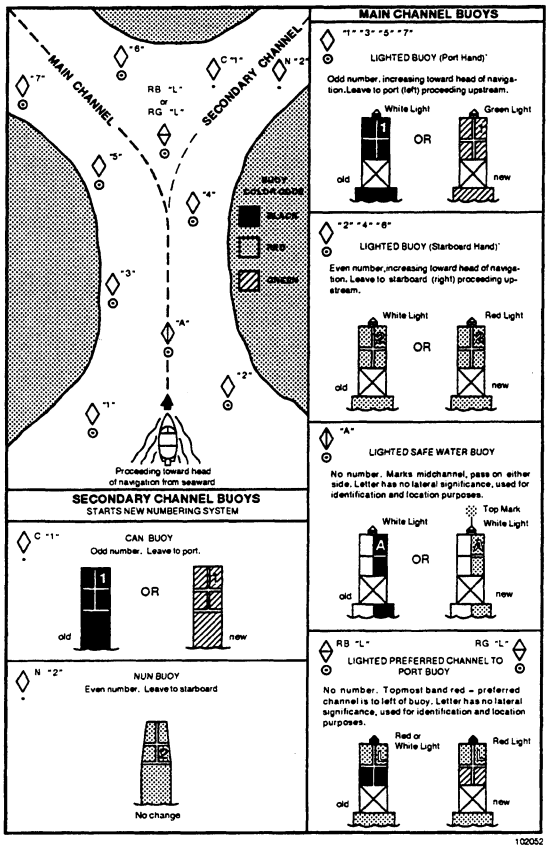
Reading buoys and other markers

The waters of the United states are marked for safe navigation by the lateral system of buoyage. Simply put, buoys and markers have an arrangement of shapes, colors, numbers and lights to show which side of the buoy a boater should pass on when navigating in a particular direction. The markings on these buoys are oriented from the perspective of being entered from seaward (the boater is going towards the port). This means that red buoys are passed on the starboard (right) side when proceeding from open water into port, and black buoys are to port (left) side. When navigating out of port, your position with respect to the buoys should be reversed; red buoys should be to port and black buoys to starboard.

Many bodies of water used by boaters are entirely within the boundaries of a particular state. The Uniform State Waterway Marking System has been devised for these waters. This system uses buoys and signs with distinctive shapes and colors to show regulatory or advisory information. These markers are white with black letters and orange boarders. They signify speed zones, restricted areas, danger areas, and general information.

Remember, markings may vary by geographic location. Always consult local boating authorities before driving your boat in unfamiliar waters.



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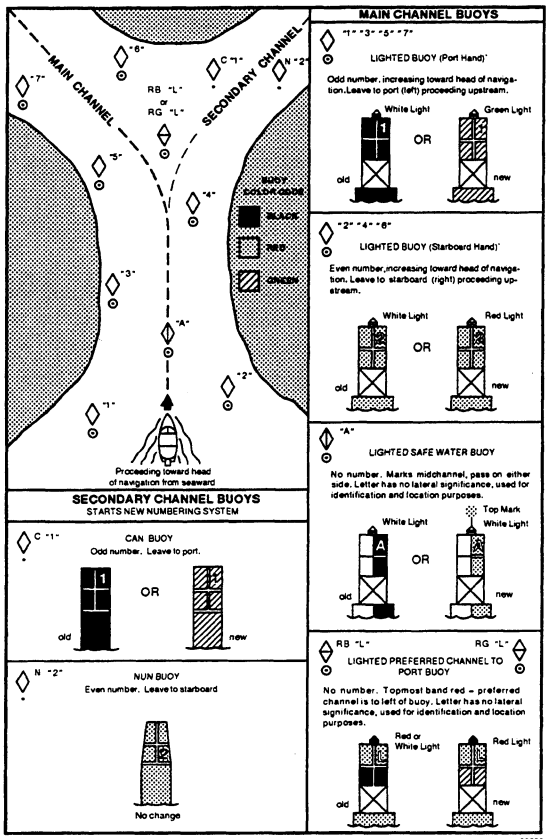
MAIN CHANNEL BUOYS
LIGHTED BUOY (Port Hand)
Odd number, increasing toward head of navigation. Leave to port (left) proceeding upstream.
White Light
Green Light
OR
old
new
LIGHTED BUOY (Starboard Hand)
Even number, increasing toward head of navigation. Leave to starboard (right) proceeding upstream.
White Light
Red Light
OR
old
new
LIGHTED SAFE WATER BUOY
No number. Marks midchannel, pass on either side. Letter has no lateral significance, used for identification and location purposes.
Top Mark
White Light
White Light
OR
old
new
LIGHTED PREFERRED CHANNEL TO PORT BUOY
No number. Topmost band red - preferred channel is to left of buoy. Letter has no lateral significance, used for identification and location purposes.
Red or White Light
Red Light
old
new
MAIN CHANNEL
SECONDARY CHANNEL
RB "L"
or
RG "L"
BUOY COLOR CODE
BLACK
RED
GREEN
Proceeding toward head of navigation from seaward
SECONDARY CHANNEL BUOYS
STARTS NEW NUMBERING SYSTEM
CAN BUOY
Odd number. Leave to port.
OR
old
new
NUN BUOY
Even number. Leave to starboard
No change
102052

EMK00100

TRANSPORTING AND STORING OUTBOARD MOTOR

TRAILERING OUTBOARD MOTOR

The motor should be trailered and stored in the normal running position. If there is insufficient road clearance in this position, then trailer the motor in the tilt position using a motor support device such as a transom saver bar.
For further details, consult a Yamaha dealer.

CAUTION:

Do not use the tilt support lever/knob when trailering the boat. The outboard motor could shake loose from the tilt support and fall. If the motor can not be trailered in the down position, use an additional support device to secure it in the up position.

⚠WARNING

- **Never get under the lower unit while it is tilted, even if a motor support bar is used. Severe injury could occur if the outboard accidentally falls.**
- **USE CARE when transporting fuel tank, whether in a boat or car.**
  DO NOT fill fuel container to maximum capacity.
  Gasoline will expand considerably as it warms up and can build up pressure in the fuel container. This can cause fuel leakage and a potential fire hazard.

When transporting or storing the outboard motor while removed from a boat, fold the tiller handle and lean the motor on the tiller handle to keep in a horizontal position.

NOTE:

Place a towel or the like under the outboard motor to protect it from damage.

CAUTION:

Keep the power unit higher than the propeller at all times. Otherwise, cooling water can run into the cylinder, which could result in damage.

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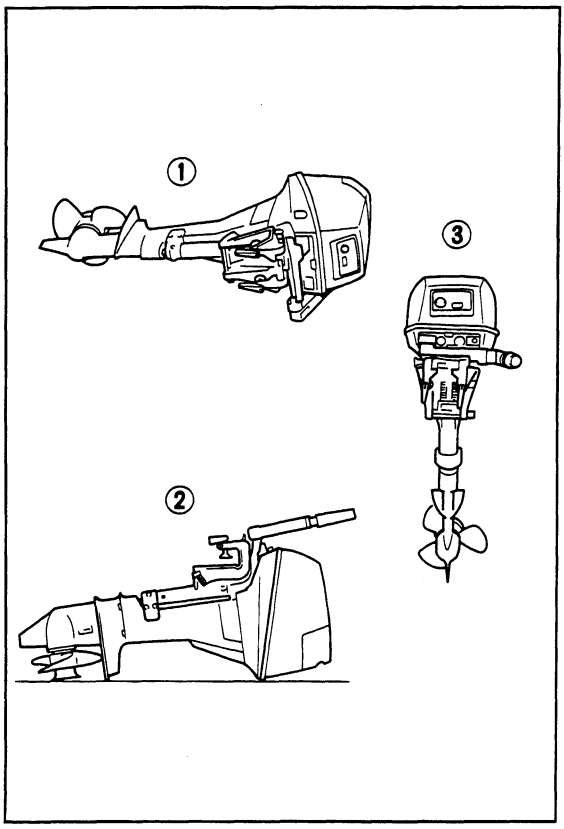


EMK10201

STORING OUTBOARD MOTOR

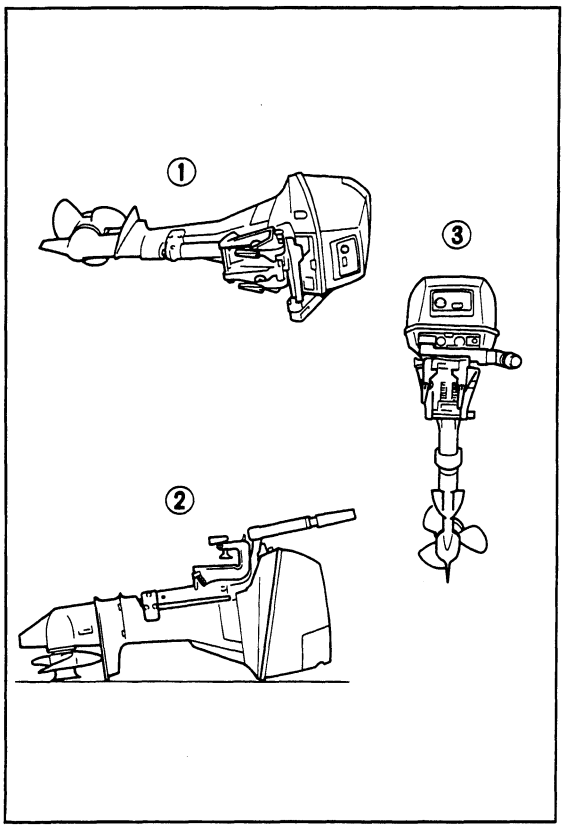
When storing your Yamaha outboard for prolonged periods of time, (2 months or longer), several important procedures must be performed to prevent expensive damage.

It is advisable to have your outboard serviced by an authorized Yamaha dealer prior to storage. However, the following procedures can be per formed by you, the owner, with a minimum of tools.

CAUTION:

- **To prevent problems which can be caused by oil entering the cylinder from the sump, keep the engine in the attitude shown when transporting and storing it.**
- **Do not place the engine on its side before the cooling water has drained from it completely, or water may enter the cylinder through the exhaust port and cause problems.**
- **Store the engine in a dry, well-ventilated place, not in direct sunlight.**

① Steering handle downward
② Cylinder head downward
③ Upright



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Filling Fuel Tank

Fill the fuel tank with fresh fuel and add one ounce of "Yamaha Fuel Conditioner and Stabilizer" (Part No. LUB-FUELC-12-00) to each gallon of fuel.

NOTE:

The use of Yamaha Fuel Conditioner and Stabilizer eliminates the need to drain the fuel system. Consult your Yamaha dealer or other qualified mechanic if the fuel system is to be drained instead.

Flushing Cooling System and Fogging Engine

Cooling system flushing is essential to prevent the cooling system from clogging up with salt, sand, or dirt. In addition, fogging of the engine is mandatory to prevent expensive engine damage due to rust. Perform the flushing and fogging at the same time.

1) Remove the cowling.
2) Install the outboard motor on the water tank, and fill the tank with fresh water to above the level of the anticavitation plate.

① Water surface
② Lowest water level

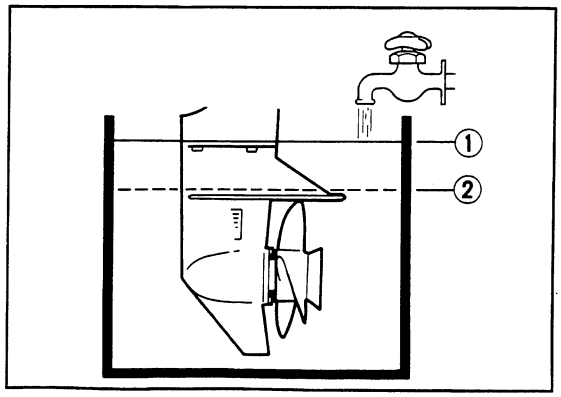
CAUTION:

If the fresh water level is below the level of the anti-cavitation plate, or if the water supply is insufficient, engine seizure may occur.

⚠WARNING

- **Do not touch or remove electrical parts when starting or during operation.**
- **Keep hands, hair and clothes away from flywheel and other rotating parts while engine is running.**

3) Run the engine at a fast idle for 10~15 minutes.
4) Just prior to turning off the engine, quickly spray "Yamaha Stor-Rite Engine Fogging Oil (Part No. LUB-STRRT-12-00) alternately into carburetor. When properly done, the engine will smoke excessively and almost stall.
5) Turn off the engine and water supply.



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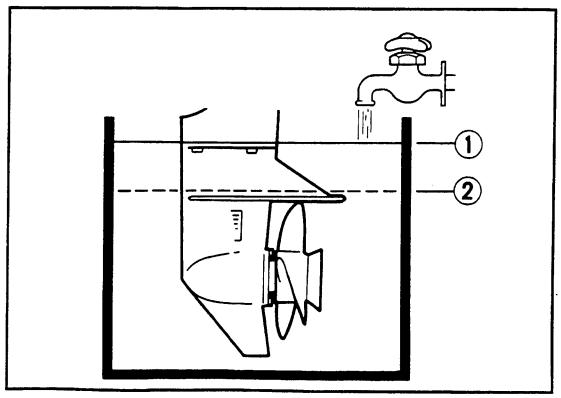

EMK11000

Lubrication

1) Remove the spark plugs, and spray a 10 second spray of Yamaha Stor-Rite Engine Fogging Oil into each cylinder. Grease the spark plug threads and reinstall the spark plugs and torque to proper specification.
   (Refer to the Periodic Cleaning and Inspection section, "Cleanning and adjusting spark plug.").
2) Turn the engine over with the stop lanyard disconnected to work the fogging oil into the piston rings.
3) Change the lower unit oil. (Refer to the Periodic Cleaning and Inpsection section, "Changing gear oil."). Inspect the oil for the presence of water which indicates a leaky seal. Seal replacement should be performed by an authorized Yamaha dealership prior to use.
4) Grease all grease fittings. (Refer to the Periodic Cleaning and Inspection section, "Greasing.")

EMK12000

Cleaning and Anti-corrosion Measure

1) Wash down the exterior of the outboard with fresh water and dry off completely.
2) Spray the engine's exterior with Yamaha Silicone Protectant (Part No. LUB-SILCNE-13-00).
3) Wax the cowling with a non-abrasive wax such as Yamaha Silicone Wax (Part No. ACC-11000-15-02).

EMK13000

Battery Care

⚠WARNING

Battery electrolyte is poisonous and dangerous, causing severe burns, etc. It contains sulfuric acid. Avoid contact with skin, eyes, or clothing.
Antidote:
EXTERNAL; Flush with water.
INTERNAL; Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.
EYES; Flush with water for 15 minutes and get prompt medical attention.
Batteries produce explosive gases: Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in a closed space. Always wear eye protection when working near batteries.
KEEP OUT OF REACH OF CHILDREN.

Batteries vary among manufacturers. Therefore the following procedures may not always apply. Consult your battery manufacturer's instructions.

1) Disconnect and remove the battery from the boat. Always disconnect the black negative lead first to prevent the risk of shorting.
2) Clean the battery casing and terminals. Fill each cell to the upper level with distilled water.
3) Store the battery on a level surface in a cool, dry, well-ventilated place out of direct sunlight.
4) Once a month, check the specific gravity of the electrolyte and recharge as required to prolong battery life.

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8-4

EMU00913

PERIODIC MAINTENANCE

⚠WARNING

Be sure to turn off the engine when you perform maintenance unless otherwise specified. If the owner is not familiar with machine servicing, this work should be done by a Yamaha dealer or other qualified mechanic.

Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine engine repair establishment or individual. All warranty repairs, however, including those to the emission control system, must be performed by an authorized Yamaha marine dealership.

A service manual is available for purchase through a Yamaha dealer for owners who have the mechanical skills, tools, and other equipment necessary to perform maintenance not covered by this owner's manual.

EMK33011

REPLACEMENT PARTS

If replacement parts are necessary, use only genuine Yamaha parts or equivalents of the same type and of equivalent strength and materials. Any part of inferior quality may malfunction, and the resulting loss of control could endanger the operator and passengers.

Yamaha genuine parts and accessories are available from a Yamaha dealer.

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CLEANING AND INSPECTION CHART

Frequency of maintenance operations may be adjusted according to the operating conditions, but the following table gives general guidelines.

The mark (●) indicates the check-ups which you may carry out yourself.

The mark (○) indicates work to be carried out by your Yamaha dealer.

Item \ Interval		Initial		Every		Refer Page
		10 hours (1 month)	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)	
Spark plug(s)	Cleaning/Adjustment/Replacement	●	●	●		9-3
Greasing points	Greasing			●		9-4
Gear oil	Change	●		●		9-7
Fuel system	Inspection			●		9-9
Fuel filter	Inspection/Replacement	●	●	●		9-10
Fuel tank *1	Cleaning				●	9-11
Idling speed	Inspection/Adjustment			●		9-12
Anode(s)	Inspection/Replacement		○	○		9-13
Outboard motor exterior	Inspection		●	●		9-20
Cooling water passages *2	Flushing		●	●		8-3
Propeller/Cotter pin	Inspection		●	●		9-14
Timing belt	Inspection/Replacement			○		9-16
Battery *3	Inspection/Charge	● (every 1 month)				9-18
Carburetor setting	Inspection/Adjustment	○		○		—
Ignition timing	Inspection/Adjustment	○		○		—
Bolts and nuts	Retightening	○		○		9-20
Engine oil	Change	●		●		9-5
Oil filter	Cleaning	●		●		9-5
	Change				○	9-5
Valve clearance	Inspection/Adjustment	○		○		—

*1 .....If a portable fuel tank is equipped.

*2 .....When operating in salt water, turbid or muddy water, the engine should be flushed with clean water after each use.

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Fuel filter	Inspection/Replacement	●	●	●		9-10
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Idling speed	Inspection/Adjustment			●		9-12
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Oil filter	Cleaning	●		●		9-5
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EML20001

CLEANING AND ADJUSTING SPARK PLUG

The spark plug is an important engine component and is easy to inspect. The condition of the spark plug can indicate something about the condition of the engine. For example, if the center electrode porcelain is very white, this could indicate an intake air leak or carburetion problem in that cylinder. Do not attempt to diagnose any problems yourself. Instead, take the outboard motor to a Yamaha dealer. You should periodically remove and inspect the spark plug because heat and deposits will cause the spark plug to slowly break down and erode. If electrode erosion becomes excessive, or if carbon and other deposits are excessive, you should replace the spark plug with another of the correct type.

Standard spark plug:
Refer to "SPECIFICATIONS."

Before fitting the spark plug, measure the electrode gap with a wire thickness gauge; adjust the gap to specification if necessary.

Spark plug gap:
Refer to "SPECIFICATIONS."

When fitting the plug, always clean the gasket surface and use a new gasket. Wipe off any dirt from the threads and screw in the spark plug to the correct torque.

Spark plug torque:
Refer to "SPECIFICATIONS."

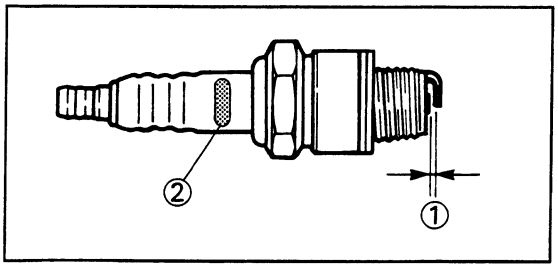
NOTE:

If a torque-wrench is not available when you are fitting a spark plug, a good estimate of the correct torque is 1/4 to 1/2 a turn past finger-tight. Have the spark plug adjusted to the correct torque as soon as possible with a torque-wrench.

⚠WARNING

When removing or installing a spark plug, be careful not to damage the insulator. A damaged insulator could allow external sparks, which could lead to explosion or fire.

Spark plug I.D. mark	Plug-wrench size
CR*HS	16 mm (5/8")
B*HS (–10) BR*HS (–10)	21 mm (13/16")



① Spark plug gap
② Spark plug I.D. mark (NGK)

EML20001

CLEANING AND ADJUSTING SPARK PLUG

The spark plug is an important engine component and is easy to inspect. The condition of the spark plug can indicate something about the condition of the engine. For example, if the center electrode porcelain is very white, this could indicate an intake air leak or carburetion problem in that cylinder. Do not attempt to diagnose any problems yourself. Instead, take the outboard motor to a Yamaha dealer. You should periodically remove and inspect the spark plug because heat and deposits will cause the spark plug to slowly break down and erode. If electrode erosion becomes excessive, or if carbon and other deposits are excessive, you should replace the spark plug with another of the correct type.

Standard spark plug:
Refer to "SPECIFICATIONS."

Before fitting the spark plug, measure the electrode gap with a wire thickness gauge; adjust the gap to specification if necessary.

Spark plug gap:
Refer to "SPECIFICATIONS."

When fitting the plug, always clean the gasket surface and use a new gasket. Wipe off any dirt from the threads and screw in the spark plug to the correct torque.

Spark plug torque:
Refer to "SPECIFICATIONS."

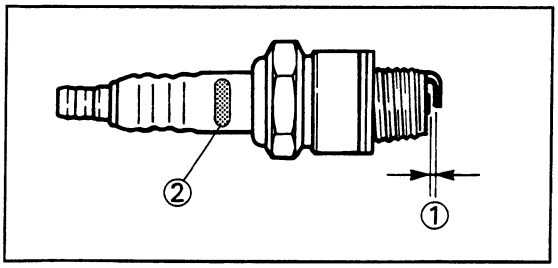
NOTE:

If a torque-wrench is not available when you are fitting a spark plug, a good estimate of the correct torque is 1/4 to 1/2 a turn past finger-tight. Have the spark plug adjusted to the correct torque as soon as possible with a torque-wrench.

⚠WARNING

When removing or installing a spark plug, be careful not to damage the insulator. A damaged insulator could allow external sparks, which could lead to explosion or fire.

Spark plug I.D. mark	Plug-wrench size
CR*HS	16 mm (5/8")
B*HS (–10) BR*HS (–10)	21 mm (13/16")

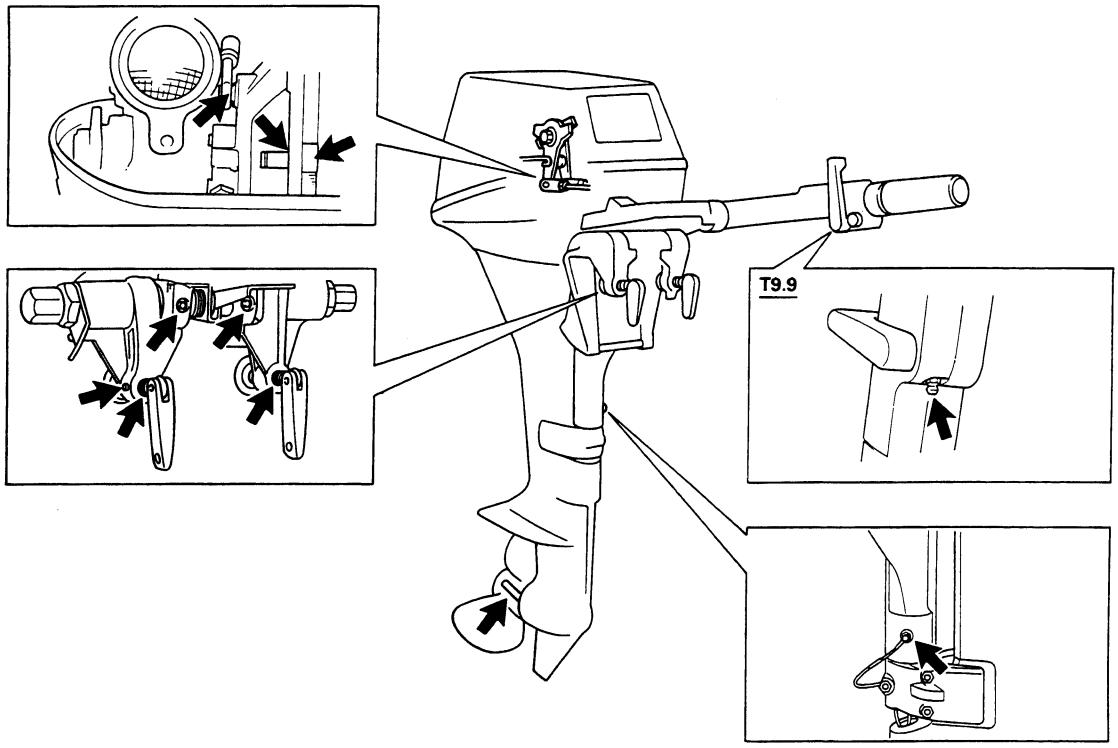


① Spark plug gap
② Spark plug I.D. mark (NGK)

EML30002

GREASING

Yamaha marine grease
(Water-resistent grease)



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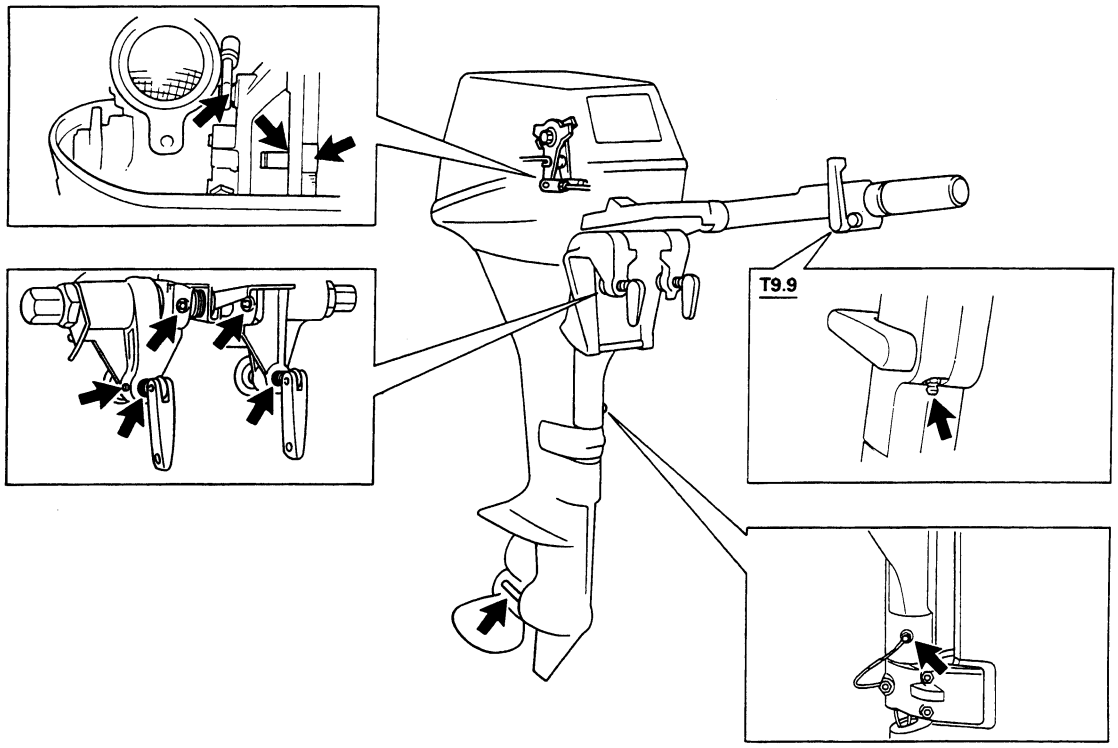
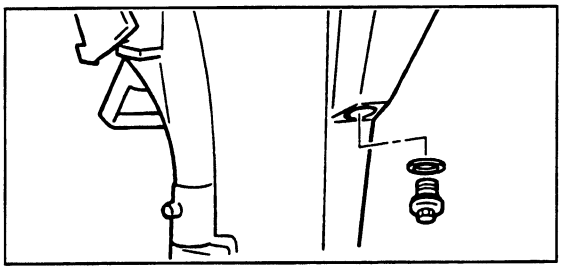
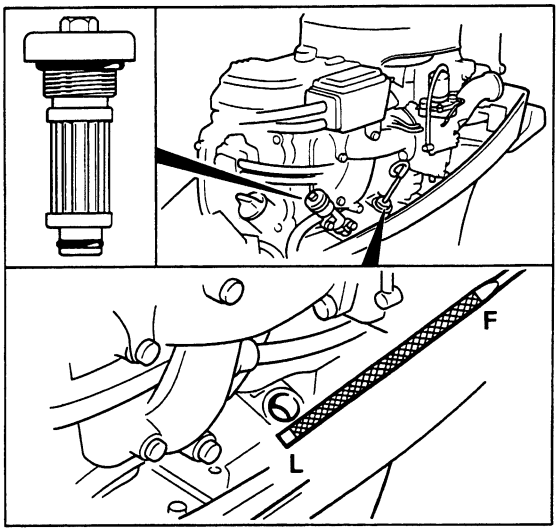






EML50001

CHANGING ENGINE OIL AND CLEANING OIL FILTER

⚠WARNING

- **Avoid draining the engine oil immediately after stopping the engine.**
  The oil is hot and should be handled with care to avoid burns.
- **Be sure the outboard is securely fastened to the transom or a stable stand.**

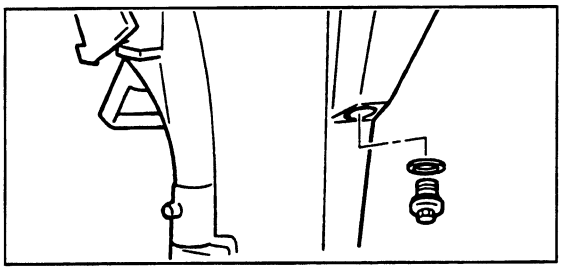
CAUTION:

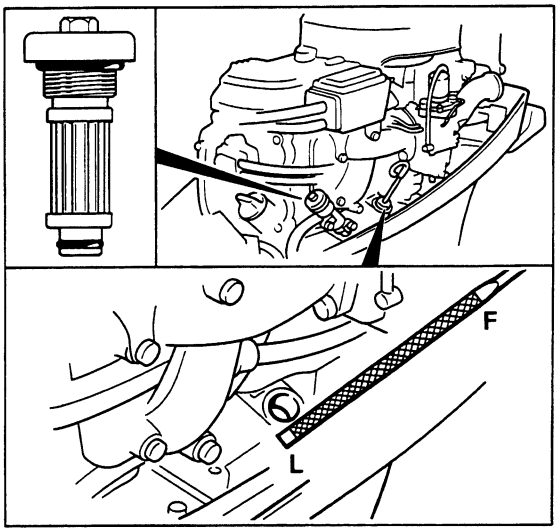
Change the engine oil after the first 10 hours of operation, and every 100 hours or at 6-month intervals thereafter. Otherwise, the engine will wear quickly.

NOTE:

The oil should be changed more often when the engine is operated under adverse conditions such as extended trolling.

1) Place the outboard motor in an upright position.
2) Prepare a suitable container with more than 1 liter (1 qt). Loosen the drain bolt, then hold the container under the drain hole as you remove the bolt. Let the oil drain completely. Wipe up any spilled oil immediately.
3) Loosen the oil filter and remove it.
4) Gently wipe the oil filter off with your fingers. Remove any fine material with a toothbrush or similar brush. Wash the filter in solvent and dry it.





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CAUTION:

- **Handle the filter carefully to avoid damaging it.**
- **Replace the filter if it is damaged (cracked, torn, dented, etc.) or rusted. Replace the filter yearly, regardless of condition.**

5) Put new gaskets on the filter and drain bolt. Lubricate the gaskets, then reinstall the filter and drain bolt.

Tightening torque: Refer to "SPECIFICATIONS."

NOTE:

If a torque wrench is not available when you are installing the drain plug, finger tighten the bolt just until the gasket contacts the surface of the drain hole. Then tighten one-half turn. Have the drain plug torqued to the correct value with a torque wrench as soon as possible.

6) Add the correct amount of oil through the filler hole. Reinstall the filler cap.

Engine oil capacity: Refer to "SPECIFICATIONS."

CAUTION:

Do not overfill the oil. Be sure that the outboard is upright (not tilted) when checking the oil.

7) Start the engine and watch to make sure the oil pressure indicator lamp comes on. Make sure that there are no oil leaks.

CAUTION:

If the oil lamp does not come on, or if there are oil leaks, stop the engine and find the cause. If the problem cannot be found and corrected, consult your Yamaha dealer. Continued operation with a problem could cause severe engine damage.

8) Dispose of used oil according to local regulations.

NOTE:

For disposal of used oil consult your Yamaha dealer.

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EML60000

CHANGING GEAR OIL

⚠WARNING

Never get under the lower unit while it is tilted, even when the tilt- support lever is locked. Severe injury could occur if the outboard accidentally falls.

1) Put the outboard in a vertical position (not tilted).

⚠WARNING

Be sure the outboard is securely fastened to the transom or a stable stand. You could be severely injured if the outboard falls on you.

2) Place a suitable container under the gearcase.
3) Remove the oil drain plug.
4) Remove the oil level plug to allow the oil to drain completely.

CAUTION:

Inspect the used oil after it has been drained. If the oil is milky, water is getting into the gearcase which can cause gear damage. Consult a Yamaha dealer for repair of the lower unit seals.

NOTE:

For disposal of used oil consult your Yamaha dealer.

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NOTE:

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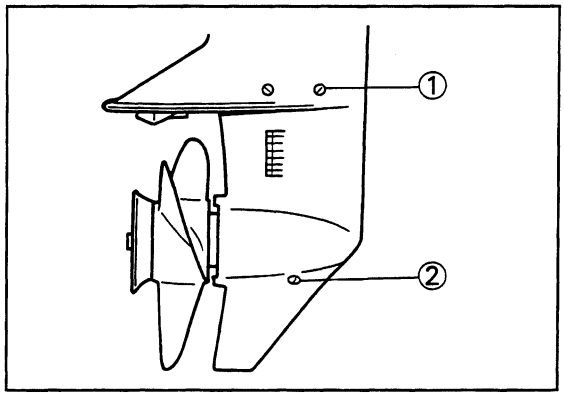
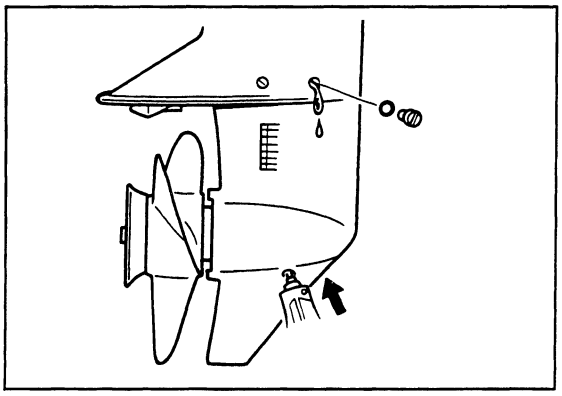


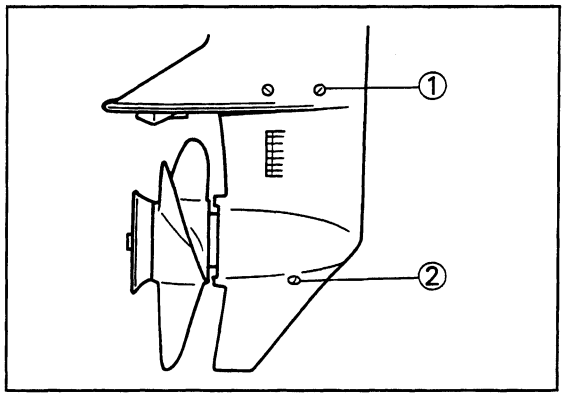


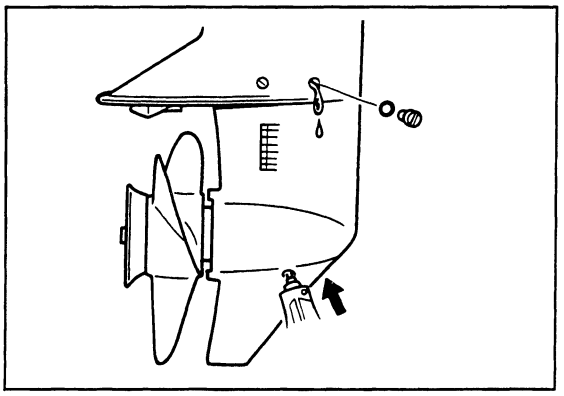
5) With the outboard motor in an upright position, using a flexible or pressurized filling device, inject outboard motor hypoid gear oil (SAE 90) into the oil drain plug hole.

Gear oil capacity:
Refer to "SPECIFICATIONS."

① Oil-level plug
② Oil drain-plug

6) When oil begins to flow out of the oil level plug hole, insert and tighten the oil level plug.
7) Screw in the oil drain plug.





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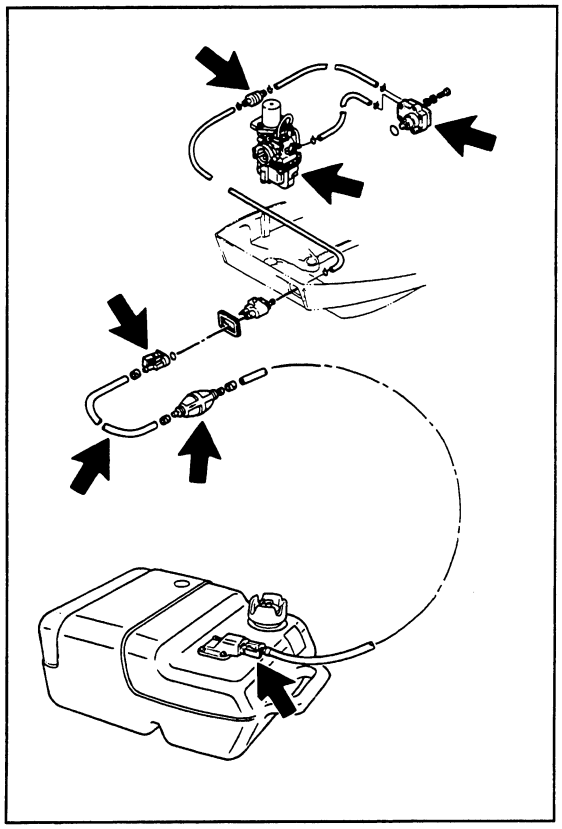


EMM00000

CHECKING FUEL SYSTEM

⚠WARNING

Gasoline and its vapors are highly flammable and explosive. Keep away from sparks, cigarettes, flames or other sources of ignition.

Check the fuel line for leaks, cracks, or malfunctions. If any problem is found, it should be repaired immediately by Yamaha dealer or other qualified mechanic.

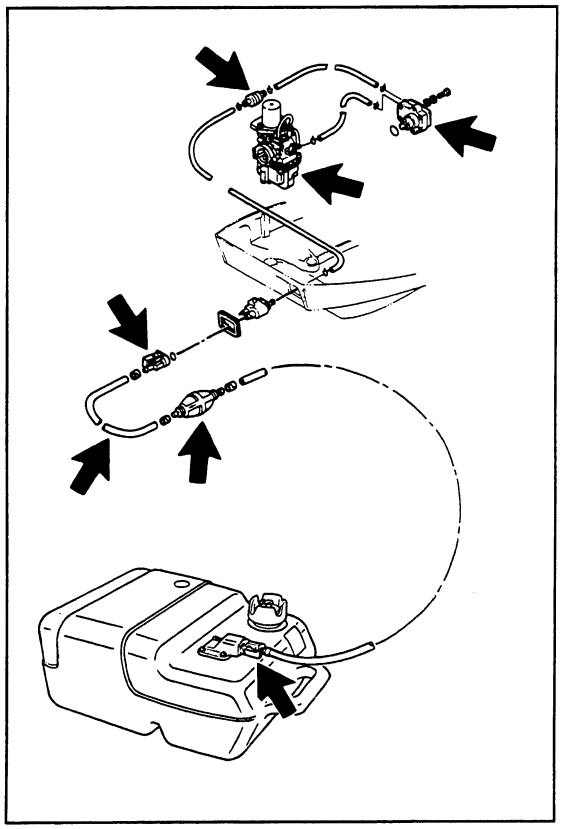
Checking points

- Fuel system parts leakage.
- Fuel hose joint leakage.
- Fuel hose cracks or other damage.
- Fuel connector leakage.

⚠WARNING

Leaking fuel can result in fire or explosion.

- **Check for fuel leakage regularly.**
- **If any fuel leakage is found, the fuel system must be repaired by a qualified mechanic.**
  Improper repairs can make the outboard unsafe to operate.



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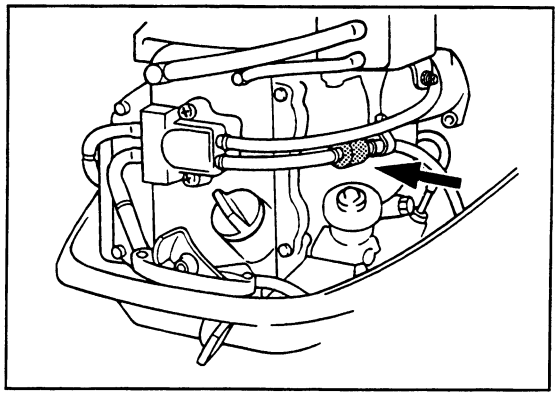
EMM21000

INSPECTING AND REPLACING FUEL FILTER

⚠WARNING

Gasoline is highly flammable, and its vapors are flammable and explosive.

- **If you have any question about properly doing the procedure, consult your Yamaha dealer.**
- **Do not perform this procedure on a hot or running engine. Allow the engine to cool.**
- **There will be fuel in the fuel filter.**
  Keep away from sparks, cigarettes, flames or other sources of ignition.
- **This procedure will allow some fuel to spill.**
  Catch fuel in a rag. Wipe up any spilled fuel immediately.
- **Improper replacement can result in a fuel leak, which could result in a fire or explosion hazard.**



Check the fuel filter periodically.
The fuel filter is a one-piece, disposable type. If foreign matter is found in the filter, replace it. For replacement of the fuel filter, consult a Yamaha dealer.

EMM21000

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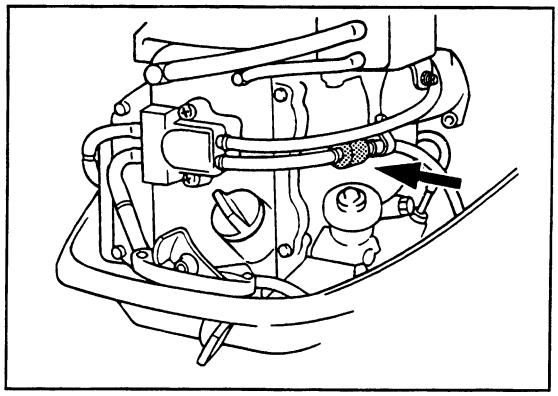

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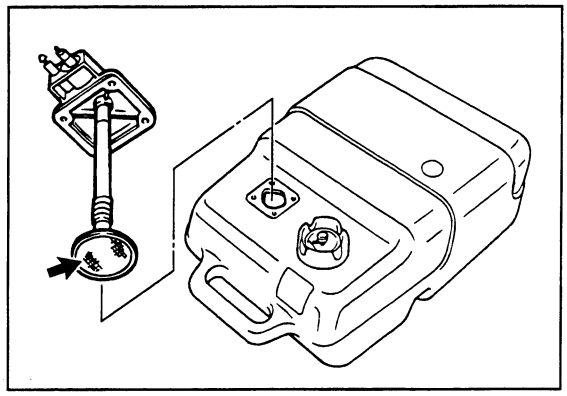
EMM30000

CLEANING FUEL TANK

⚠WARNING

Gasoline is highly flammable, and its vapors are flammable and explosive.

- **If you have any question about properly doing this procedure, consult your Yamaha dealer.**
- **Keep away from sparks, cigarettes, flames or other sources of ignition when cleaning the fuel tank.**
- **Remove the fuel tank from the boat before cleaning it. Work only outdoors in an area with good ventilation.**
- **Wipe up any spilled fuel immediately.**
- **Reassemble the fuel tank carefully.**
  Improper assembly can result in a fuel leak, which could result in a fire or explosion hazard.
- **Dispose of old gasoline according to local regulations.**



To clean the fuel tank:

1) Empty the fuel tank into an approved gasoline container.
2) Pour a small amount of suitable solvent in the tank. Reinstall the cap and shake the tank. Drain the solvent completely.

To clean the fuel filter:

1) Remove the screws holding the fuel meter assembly. Pull the assembly out of the tank.
2) Clean the filter (located on the end of the suction pipe) in a suitable cleaning solvent. Allow the filter to dry.
3) Replace the gasket with a new one. Reinstall the fuel meter assembly and tighten the screws firmly.

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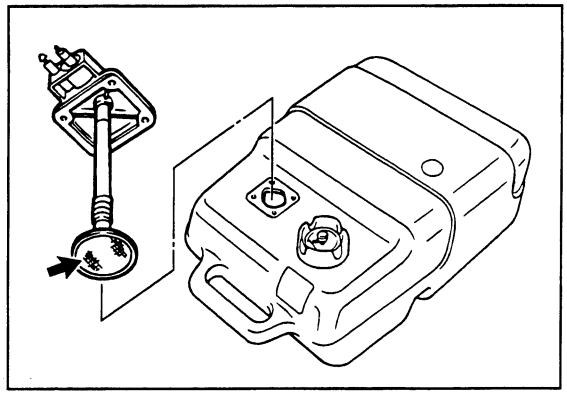

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EMM40100

ADJUSTING IDLING SPEED

⚠WARNING

- **Do not touch or remove electrical parts when starting or during operation.**
- **Keep hands, hair and clothes away from flywheel and other rotating parts while engine is running.**

CAUTION:

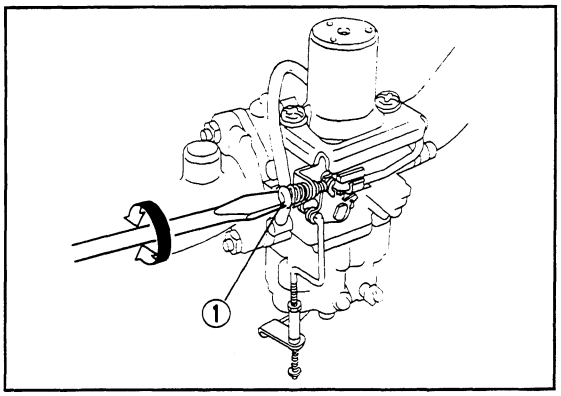
This procedure must be performed while the outboard motor is in the water. A flushing attachment or test tank can be used.

A diagnostic tachometer should be used for this procedure.

1) Start the engine and allow it to warm up fully in Neutral until it is running smoothly.
   If the outboard is mounted on a boat, be sure the boat is tightly moored.
2) Adjust the throttle stop-screw to set the idling speed to specification (see "SPECIFICATIONS") by turning the stop-screw clockwise to increase the idling speed, and turning it counterclockwise to decrease the idling speed.

NOTE:

Correct idling-speed adjustment is only possible if the engine is fully warmed-up. If not warmed up fully, the speed setting will tend to be too high.
If you have difficulty obtaining the specified idle, consult a Yamaha dealer or other qualified mechanic.



① Throttle stop-screw

EMM40100

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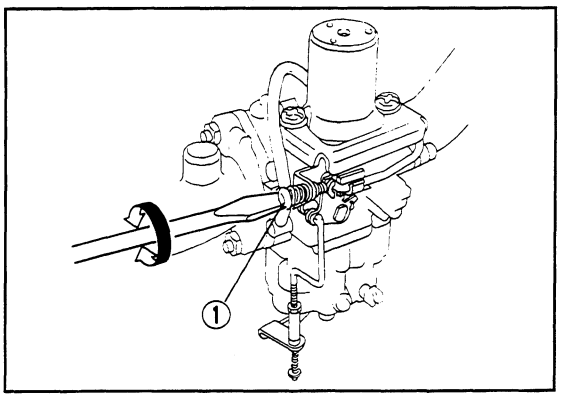

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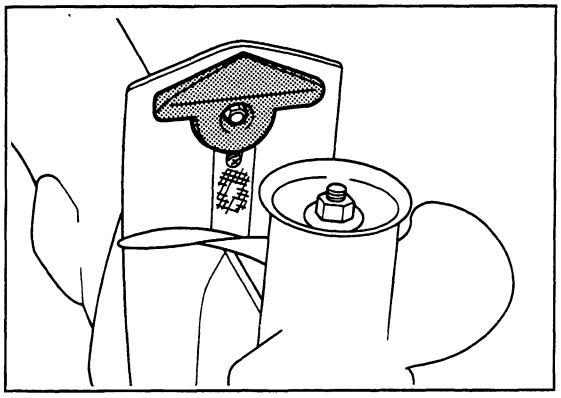


EMM60000

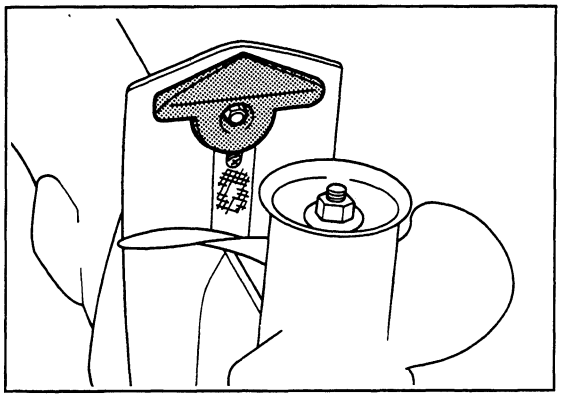
INSPECTING AND REPLACING ANODE

Yamaha outboard motor is protected from corrosion by a sacrificial anode.

Check the anode periodically. Remove the scales from surfaces of the anode.
For the replacement of the anode, consult a Yamaha dealer.

CAUTION:

Do not paint the anode, for this would render it ineffective.



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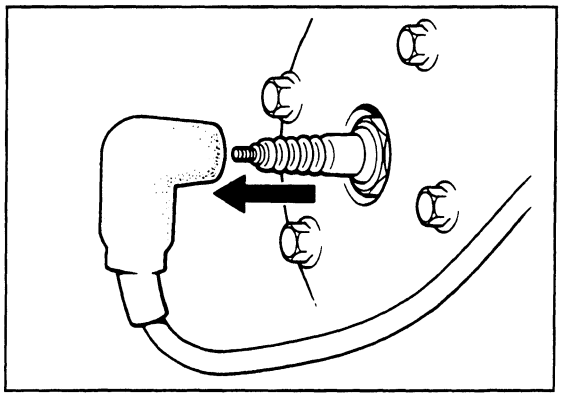
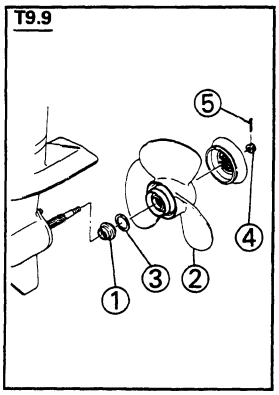
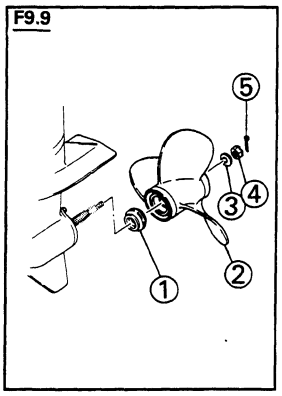






EMM70103

CHECKING PROPELLER

⚠WARNING

You could be seriously injured if the engine accidentally starts while you are near the propeller.

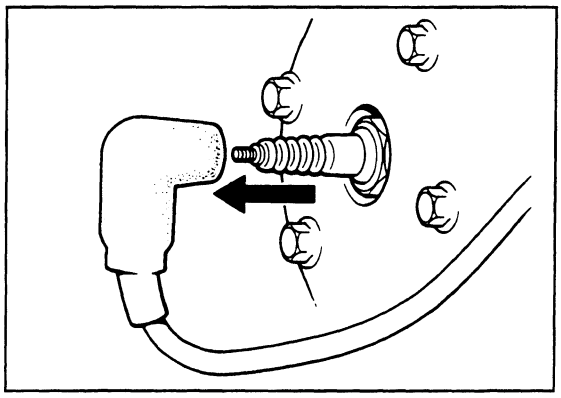
- **Before inspecting, removing or installing the propeller, remove the spark plug caps from the spark plugs. Also, put the shift control in Neutral, put the main switch in the OFF position and remove the key, and remove the lanyard from the engine stop switch. Turn off the battery cut-off switch if your boat has one.**
- **Do not use your hand to hold the propeller when loosening or tightening the propeller nut. Put a wood block between the cavitation plate and the propeller to prevent the propeller from turning.**

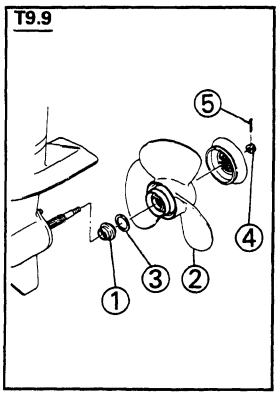
1) Check each of the propeller blades for wear, erosion from cavitation or ventilation, or other damage.
2) Check the splines for wear and damage.
3) Check for fish line winding around the propeller shaft. Check the propeller shaft oil seal for damage.

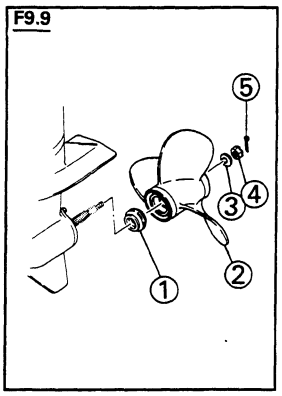
[How to remove propeller]

1) Using the pliers provided, straighten the cotter-pin and pull it out.
2) Remove the propeller nut.
3) Remove the propeller.

① Thrust washer
② Propeller
③ Washer
④ Propeller nut
⑤ Cotter pin







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① Thrust washer
② Propeller
③ Washer
④ Propeller nut
⑤ Cotter pin

9-14

[How to install propeller]

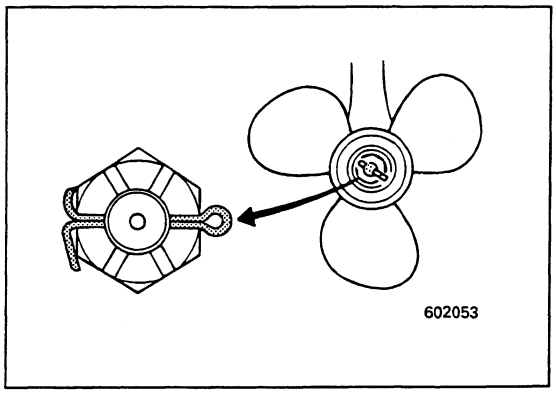
1) Apply Yamaha Marine grease (water-resistant grease) to the propeller-shaft.
2) Slide the propeller over the propeller-shaft.

CAUTION:

Be sure to install the thrust washer before installing propeller, otherwise, lower case and propeller boss may be damaged.

3) Tighten the propeller nut to the specified torque.

Tightening torque:
Refer to "SPECIFICATIONS".



4) Align the propeller nut with the propeller shaft hole. Insert a new cotter pin in the hole and bend the cotter pin ends.

CAUTION:

Be sure to use a new cotter pin and bend the ends over securely. Otherwise, the propeller could come off during operation and be lost.

[How to install propeller]

1) Apply Yamaha Marine grease (water-resistant grease) to the propeller-shaft.
2) Slide the propeller over the propeller-shaft.

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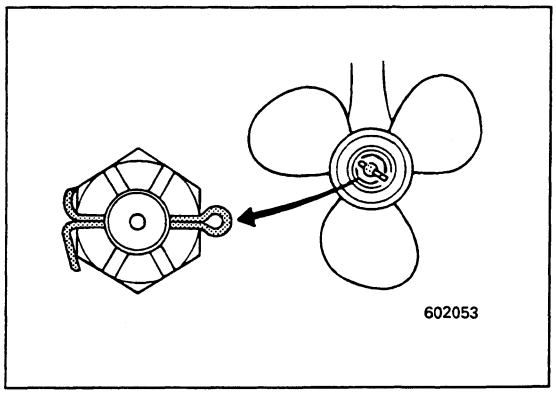

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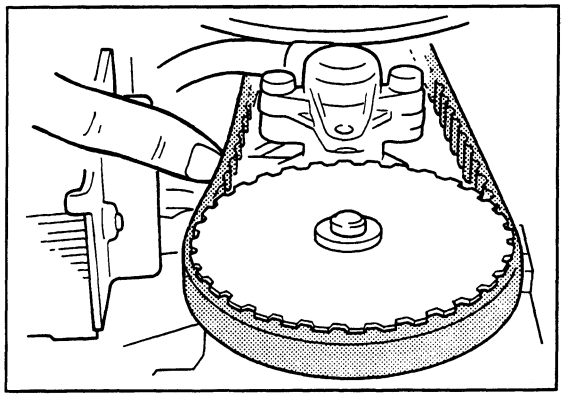


EMN00000

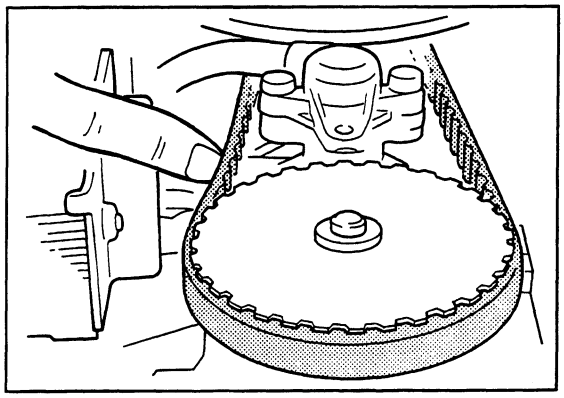
CHECKING TIMING BELT

Inspect the timing-belt and replace it if any to the following signs is observed:

- Cracks in the back of the belt or in the base of belt teeth.
- Excessive wear at the roots of cogs.
- Rubber portion swollen by oil.
- Belt surfaces roughened.
- Signs of wear on edges or outer surface of belt.
- Stretching by 10 mm (0.39 in) or more when the belt is pushed with a finger.

CAUTION:

Consult your Yamaha dealer when replacing the timing-belt.



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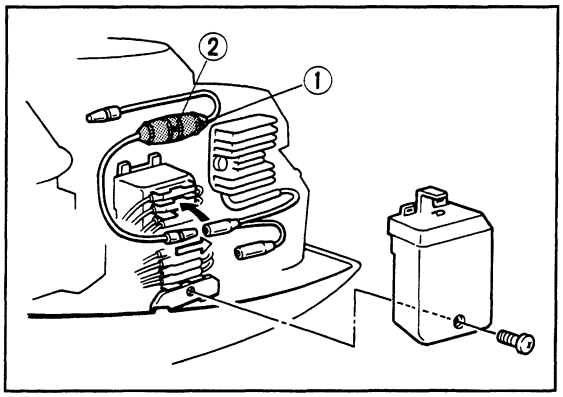
9-16



EMN40000

REPLACING FUSE (for Electric start model)

If the fuse has blown, open the fuse box and replace the fuse with a new one of the proper amperage.

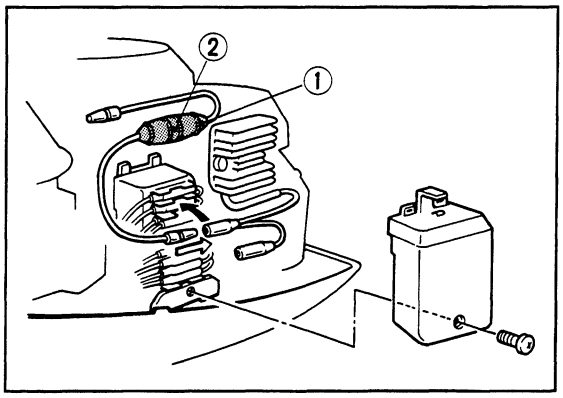
NOTE:

If the new fuse blows again immediately, consult a Yamaha dealer.

① Fuse box
② Fuse (20A)

⚠WARNING

Be sure to use the specified fuse.
A wrong fuse or a piece of wire may allow excessive current flow. This could cause electrical system damage and a fire hazard.



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A wrong fuse or a piece of wire may allow excessive current flow. This could cause electrical system damage and a fire hazard.

EMN50000

CHECKING BATTERY

⚠WARNING

Battery electrolytic fluid is dangerous; it contains sulfuric acid and therefore is poisonous and highly caustic.
Always follow these preventive measures:

- **Avoid bodily contact with electrolytic fluid as it can cause severe burns or permanent eye injury.**
- **Wear protective eye gear when handling or working near batteries.**

Antidote (EXTERNAL):

- **SKIN—Flush with water.**
- **EYES—Flush with water for 15 minutes and get immediate medical attention.**

Antidote (INTERNAL):

- **Drink large quantities of water or milk followed by milk of magnesia, beaten egg, or vegetable oil. Get immediate medical attention.**

Batteries also generate explosive hydrogen gas; therefore, you should always follow these preventive measures:

- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.).**
- **DO NOT SMOKE when charging or handling batteries.**
- **KEEP BATTERIES AND ELECTROLYTIC FLUID OUT OF REACH OF CHILDREN.**

CAUTION:

A poorly maintained battery will quickly deteriorate.

1) Check the electrolyte level at least once a month. Fill to the manufacturer's recommended level when necessary. Top-up only with distilled water (or pure de-ionized water suitable to use in batteries).

CAUTION:

Ordinary tap-water contains minerals harmgul to a battery, and should not be used for topping-up.

2) Keep the battery always in a good state of charge. Installing a voltmeter will help you monitor your battery. If you will not use the boat for a month or more, remove the battery from the boat and store it in a cool, dark place. Completely recharge the battery before using it.
3) If the battery will be stored for longer than a month, check the specific gravity of the fluid at least once a month and recharge the battery when it is low.

EMN50000

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Battery electrolytic fluid is dangerous; it contains sulfuric acid and therefore is poisonous and highly caustic.
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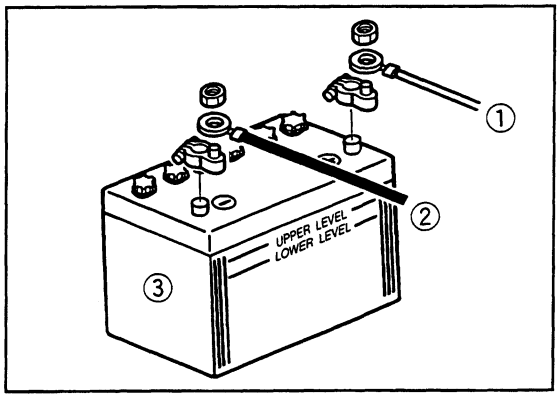


EMN51001

Connecting the battery

⚠WARNING

Mount the battery holder securely in a dry, well-ventilated, vibration-free location in the boat. Install the fully charged battery in the holder.

Connect the RED lead to the POSITIVE (+) terminal first. Then connect the BLACK lead to the NEGATIVE (–) terminal.

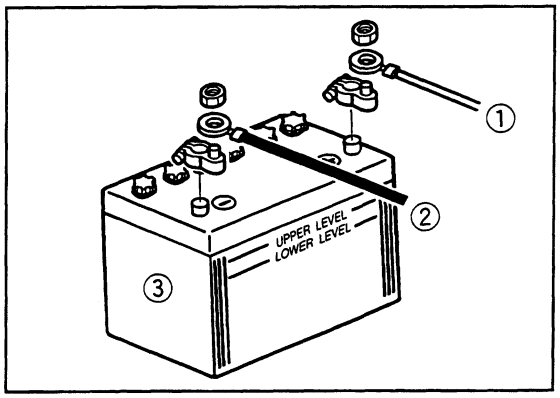
① Red lead
② Black lead
③ Battery

Disconnecting the battery

Disconnect the BLACK lead from the NEGATIVE (–) terminal first. Then disconnect the RED lead from the POSITIVE (+) terminal.

CAUTION:

- **Make sure the main switch (on applicable models) is OFF before working on the battery.**
- **Reversal of the battery leads will damage the rectifier.**
- **Connect the RED lead first when installing the battery and disconnect the RED lead last when removing it. Otherwise, the electrical system can be damaged.**
- **The electrical contacts of the battery and cables must be clean and properly connected, or the battery will not start the engine.**



EMN51001

Connecting the battery

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EMP00001
CHECKING WIRING AND CONNECTORS
1) Check that each grounding wire is properly secured.
2) Check that each connector is engaged securely.

EXHAUST LEAKAGE
Start the engine and check that no exhaust leaks from the joints between the exhaust cover, cylinder head and crank case.

WATER LEAKAGE
Start the engine and check that no water leaks from the joints between the exhaust cover, cylinder head and crank case.

EMP20001
CHECKING BOLTS AND NUTS
1) Check that bolts securing the cylinder head and engine and the nut securing the flywheel are tightened with their specified tightening torques.
2) Check the tightening torques of other bolts and nuts.

EMP40000
MOTOR EXTERIOR
EML42511
Cleaning the Outboard Motor
After use, wash the exterior of the outboard with fresh water.
Flush the cooling system with fresh water.

NOTE:
RRefer to Flushing Cooling System instructions in "TRANSPORTING AND STORING OUTBOARD MOTOR".

Checking Painted Surface of Motor
Check the motor for scratches, nicks, or flaking paint. Areas with damaged paint are more likely to corrode.
If necessary, clean and paint the areas.
Consult a Yamaha dealer for touch-up paint.

EMP60000
COATING THE BOAT BOTTOM
A clean hull improves boat performance.
The boat bottom should be kept as clean of marine growths as possible.
If necessary, the boat bottom can be coated with an anti-fouling paint approved for your area to inhibit marine growth.
Do not use anti-fouling paint which includes copper or graphite. These paints can cause more rapid engine corrosion.

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EMN50012

TREATMENT OF SUBMERGED MOTOR

If the outboard motor is submerged, immediately take it a Yamaha dealer. Otherwise, some corrosion may begin almost immediately.

If you cannot immediately take the outboard motor to a Yamaha dealer, follow the procedure bellow for taking care to minimize engine damage.

EMN50611

1) Thoroughly wash away mud, salt, seaweed, etc. with fresh water.
2) Remove the spark plug(s), then face the spark plug holes downward to allow any water, mud or contaminants to drain.
3) Drain the fuel from the carburetor, fuel filter and fuel line. Drain the engine oil completely.
4) Fill the sump with the fresh engine oil as the same quantity as the engine oil capacity.

Engine oil capacity: Refer to SPECIFICATIONS.

5) Feed engine fogging oil or engine oil through the carburetor(s) and spark plug hole(s) while cranking the engine with the manual starter or emergency starter rope.
6) Take the outboard motor to a Yamaha dealer as soon as possible.

CAUTION:

Do not attempt to run the motor until it has been completely inspected.

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CAUTION:

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10-1

TROUBLESHOOTING

Trouble	Possible Cause	Remedy
A. Starter will not operate	1. Battery capacity weak or low	1. Check battery condition. Use battery of recommended capacity.
	2. Battery connections loose or corroded	2. Tighten battery cables and clean battery terminals.
	3. Fuse for electric start circuit blown	3. Check for cause of electric overload and repair. Replace fuse with one of correct amperage.
	4. Starter components faulty	4. Have Yamaha dealer service.
	5. Engine stop switch lanyard not attached	5. Attach lanyard.
	6. Shift lever is gear-in position	6. Position to neutral.
B. Engine will not start (Starter operates)	1. Fuel tank empty	1. Fill tank with clean, fresh fuel.
	2. Fuel contaminated or stale	2. Fill tank with clean, fresh fuel.
	3. Fuel filter clogged	3. Clean or replace it.
	4. Starting procedure wrong	4. Read owner's manual.
	5. Fuel pump malfunctions	5. Have Yamaha dealer service.
	6. Spark plug(s) fouled or wrong type	6. Inspect spark plug(s). Clean or replace with recommended type.
	7. Spark plug cap(s) fitted incorrectly	7. Check and re-fit cap(s).
	8. Poor connections or damaged ignition wiring	8. Check wires for wear or breaks. Tighten all loose connections. Replace worn or broken wires.
	9. Ignition parts faulty	9. Have Yamaha dealer service.
	10. Engine stop switch lanyard not attached	10. Attach lanyard.
	11. Shift lever is gear-in position	11. Position to neutral.
	12. Engine inner parts damaged	12. Have Yamaha dealer service.

EMR10000

TROUBLESHOOTING

Trouble	Possible Cause	Remedy
A. Starter will not operate	1. Battery capacity weak or low	1. Check battery condition. Use battery of recommended capacity.
	2. Battery connections loose or corroded	2. Tighten battery cables and clean battery terminals.
	3. Fuse for electric start circuit blown	3. Check for cause of electric overload and repair. Replace fuse with one of correct amperage.
	4. Starter components faulty	4. Have Yamaha dealer service.
	5. Engine stop switch lanyard not attached	5. Attach lanyard.
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	10. Engine stop switch lanyard not attached	10. Attach lanyard.
	11. Shift lever is gear-in position	11. Position to neutral.
	12. Engine inner parts damaged	12. Have Yamaha dealer service.

11-1

Trouble	Possible Cause	Remedy
C. Engine idles irregularly or stalls	1. Spark plug(s) fouled or wrong type	1. Inspect spark plug(s). Clean or replace with recommended type.
	2. Fuel system obstructed	2. Check for pinched or kinked fuel line or other obstructions in fuel system.
	3. Fuel contaminated or stale	3. Fill tank with clean, fresh fuel.
	4. Fuel filter clogged	4. Clean or replace filter.
	5. Failed ignition parts	5. Have Yamaha dealer service.
	6. Warning system activated	6. Find and correct cause.
	7. Spark plug gap incorrect	7. Inspect and adjust as specified.
	8. Poor connections or damaged ignition wiring	8. Check wires for wear or breaks. Tighten all loose connections.
	9. Fuel filter clogged	9. Clean or replace filter.
	10. Specified engine oil not used	10. Check and replace it as specified.
	11. Thermostat faulty or clogged	11. Have Yamaha dealer service.
	12. Carburetor adjusts incorrect	12. Have Yamaha dealer service.
	13. Fuel pump damaged	13. Have Yamaha dealer service.
	14. Air vent screw is closed	14. Open the air vent screw.
	15. Choke knob is pulled	15. Return to home position.
	16. Motor angle is too high	16. Return to normal operating position.
	17. Carburetor is clogged	17. Have Yamaha dealer service.
	18. Fuel joint connection is wrong	18. Connect correctly.

Trouble	Possible Cause	Remedy
C. Engine idles irregularly or stalls	1. Spark plug(s) fouled or wrong type	1. Inspect spark plug(s). Clean or replace with recommended type.
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	15. Choke knob is pulled	15. Return to home position.
	16. Motor angle is too high	16. Return to normal operating position.
	17. Carburetor is clogged	17. Have Yamaha dealer service.
	18. Fuel joint connection is wrong	18. Connect correctly.

11-2

Trouble	Possible Cause	Remedy
D. Warning buzzer sounds or indicator lamp lights	1. Cooling system clogged	1. Check water intake for restriction.
	2. Engine oil level low	2. Fill oil tank with specified engine oil.
	3. Heat range of spark plug incorrect	3. Check the plug condition and replace it with a correct one.
	4. Specified engine oil not used	4. Check and replace it by specified one.
	5. Engine oil contaminated or deteriorated	5. Replace it with fresh, specified one.
	6. Oil filter clogged	6. Have Yamaha dealer service.
	7. Oil feed/injection pump malfunctions	7. Have Yamaha dealer service.
	8. Load on boat improperly distributed	8. Distribute load to place boat on an even plane.
	9. Water pump/thermostat faulty	9. Have Yamaha dealer service.
E. Engine power loss	1. Propeller damaged	1. Have propeller repaired or replaced.
	2. Propeller pitch or diameter wrong	2. Install correct propeller to operate outboard at its recommended rpm range.
	3. Trim angle incorrect	3. Adjust trim angle to gain most efficient operation.
	4. Motor mounted at wrong height on transom	4. Have motor adjusted to proper transom height.
	5. Warning system activated	5. Find and correct cause.
	6. Boat bottom fouled with marine growth	6. Clean boat bottom.
	7. Spark plug(s) fouled or wrong type	7. Inspect spark plug(s). Clean or replace with recommended type.
	8. Weeds or other foreign matters tangled on gear housing	8. Remove them and clean lower unit.
	9. Fuel system obstructed	9. Check for pinched or kinked fuel line or other obstructions in fuel system.
	10. Fuel filter clogged	10. Clean or replace filter.
	11. Fuel contaminated or stale	11. Fill tank with clean, fresh fuel.
	12. Spark plug gap incorrect	12. Inspect and adjust as specified.

Trouble	Possible Cause	Remedy
D. Warning buzzer sounds or indicator lamp lights	1. Cooling system clogged	1. Check water intake for restriction.
	2. Engine oil level low	2. Fill oil tank with specified engine oil.
	3. Heat range of spark plug incorrect	3. Check the plug condition and replace it with a correct one.
	4. Specified engine oil not used	4. Check and replace it by specified one.
	5. Engine oil contaminated or deteriorated	5. Replace it with fresh, specified one.
	6. Oil filter clogged	6. Have Yamaha dealer service.
	7. Oil feed/injection pump malfunctions	7. Have Yamaha dealer service.
	8. Load on boat improperly distributed	8. Distribute load to place boat on an even plane.
	9. Water pump/thermostat faulty	9. Have Yamaha dealer service.
E. Engine power loss	1. Propeller damaged	1. Have propeller repaired or replaced.
	2. Propeller pitch or diameter wrong	2. Install correct propeller to operate outboard at its recommended rpm range.
	3. Trim angle incorrect	3. Adjust trim angle to gain most efficient operation.
	4. Motor mounted at wrong height on transom	4. Have motor adjusted to proper transom height.
	5. Warning system activated	5. Find and correct cause.
	6. Boat bottom fouled with marine growth	6. Clean boat bottom.
	7. Spark plug(s) fouled or wrong type	7. Inspect spark plug(s). Clean or replace with recommended type.
	8. Weeds or other foreign matters tangled on gear housing	8. Remove them and clean lower unit.
	9. Fuel system obstructed	9. Check for pinched or kinked fuel line or other obstructions in fuel system.
	10. Fuel filter clogged	10. Clean or replace filter.
	11. Fuel contaminated or stale	11. Fill tank with clean, fresh fuel.
	12. Spark plug gap incorrect	12. Inspect and adjust as specified.

Trouble	Possible Cause	Remedy
E. Engine power loss	13. Poor connections or damaged ignition wiring	13. Check wires for wear or breaks. Tighten all loose connections Replace worn or broken wires.
	14. Failed ignition parts	14. Have Yamaha dealer service.
	15. Specified engine oil not used	15. Check and replace it as specified.
	16. Thermostat faulty or clogged	16. Have Yamaha dealer service.
	17. Air vent screw is closed	17. Open the air vent screw.
	18. Fuel pump damaged	18. Have Yamaha dealer service.
	19. Fuel joint connection is wrong	19. Connect perfect.
F. Engine vibrates excessively	1. Propeller damaged	1. Have propeller repaired or replace.
	2. Propeller shaft damaged	2. Have Yamaha dealer service.
	3. Weeds or other foreign matter tangled on propeller	3. Remove and clean propeller.
	4. Motor mounting bolt is loosen	4. Tighten the bolt.
	5. Steering pivot is loosen or damaged	5. Tighten or have Yamaha dealer service.

Trouble	Possible Cause	Remedy
E. Engine power loss	13. Poor connections or damaged ignition wiring	13. Check wires for wear or breaks. Tighten all loose connections Replace worn or broken wires.
	14. Failed ignition parts	14. Have Yamaha dealer service.
	15. Specified engine oil not used	15. Check and replace it as specified.
	16. Thermostat faulty or clogged	16. Have Yamaha dealer service.
	17. Air vent screw is closed	17. Open the air vent screw.
	18. Fuel pump damaged	18. Have Yamaha dealer service.
	19. Fuel joint connection is wrong	19. Connect perfect.
F. Engine vibrates excessively	1. Propeller damaged	1. Have propeller repaired or replace.
	2. Propeller shaft damaged	2. Have Yamaha dealer service.
	3. Weeds or other foreign matter tangled on propeller	3. Remove and clean propeller.
	4. Motor mounting bolt is loosen	4. Tighten the bolt.
	5. Steering pivot is loosen or damaged	5. Tighten or have Yamaha dealer service.

EMR20502

TEMPORARY ACTION IN EMERGENCY

Starter Will Not Operate

If the starter mechanism does not operate (engine cannot be cranked with the starter), the engine can be started with an emergency starter rope.

⚠WARNING

- **Use this procedure only in an emergency and only to return to port for repairs.**
- **When the emergency starter rope is used to start the engine, the start-in-gear protection device does not operate. Make sure the transmission is in neutral. Otherwise, the boat could unexpectedly start to move, which could result in an accident.**
- **Be sure no one is standing behind you when pulling the starter rope. It could whip behind you and injure someone.**
- **An unguarded rotating flywheel is very dangerous. Keep loose clothing and other objects away when starting the engine. Use the emergency starter rope only as instructed. Do not touch the flywheel or other moving parts when the engine is running. Do not install the starter mechanism or top cowling after the engine is running.**
- **Do not touch the ignition coil, high voltage wire, spark plug cap or other electrical components when starting or operating the motor. You could be shocked.**

EMR20502

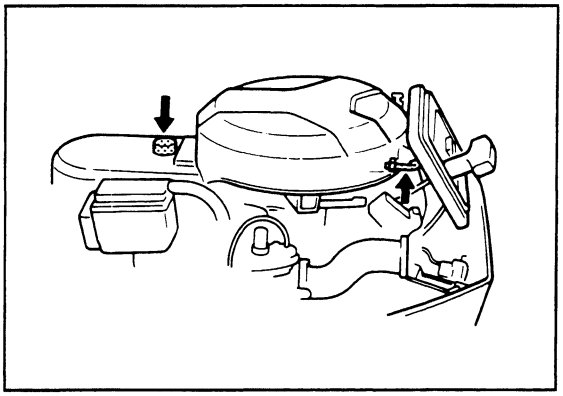
TEMPORARY ACTION IN EMERGENCY

Starter Will Not Operate

If the starter mechanism does not operate (engine cannot be cranked with the starter), the engine can be started with an emergency starter rope.

⚠WARNING

- **Use this procedure only in an emergency and only to return to port for repairs.**
- **When the emergency starter rope is used to start the engine, the start-in-gear protection device does not operate. Make sure the transmission is in neutral. Otherwise, the boat could unexpectedly start to move, which could result in an accident.**
- **Be sure no one is standing behind you when pulling the starter rope. It could whip behind you and injure someone.**
- **An unguarded rotating flywheel is very dangerous. Keep loose clothing and other objects away when starting the engine. Use the emergency starter rope only as instructed. Do not touch the flywheel or other moving parts when the engine is running. Do not install the starter mechanism or top cowling after the engine is running.**
- **Do not touch the ignition coil, high voltage wire, spark plug cap or other electrical components when starting or operating the motor. You could be shocked.**

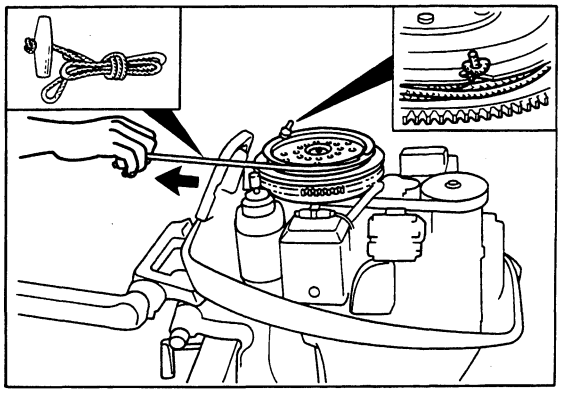


Procedure

1) To remove the cowling.
2) Pull out the lock pin, loosen the bolt, and then remove the flywheel cover.
3) Lock the front panel with the lock pin.
4) Prepare the engine for starting. See STARTING ENGINE for procedures. Be sure the engine is in Neutral and that the lanyard is attached to the engine stop lanyard switch. The main switch must be on if the main switch is equipped on the electric start model

NOTE:

Refer to "ENGINE FAILS TO START" for cold engine starting procedures.

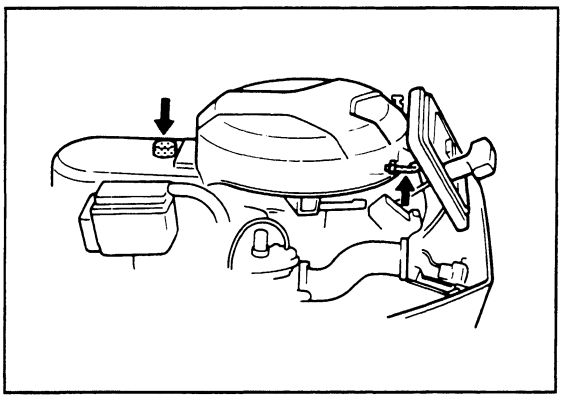


5) Insert the knotted end of the emergency starter rope, into the notch in the flywheel rotor and wind the rope several turns clockwise.
6) Pull the rope slowly until resistance is felt.
7) Then, give a strong pull straight out to crank the engine. Repeat if necessary.

EMR21000

Engine Fails to Start

1) Put the engine in neutral. Open the throttle halfway (on models with neutral throttle-limiter, open throttle as far as it will go).
2) Start the engine.
3) If the engine still will not start, open and close the throttle two or three times. This will feed additional fuel to the accelerator pump of the carburetor. Then open the throttle halfway and start the engine.

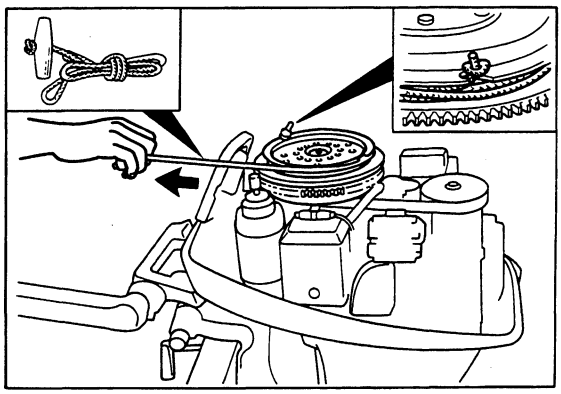


Procedure

1) To remove the cowling.
2) Pull out the lock pin, loosen the bolt, and then remove the flywheel cover.
3) Lock the front panel with the lock pin.
4) Prepare the engine for starting. See STARTING ENGINE for procedures. Be sure the engine is in Neutral and that the lanyard is attached to the engine stop lanyard switch. The main switch must be on if the main switch is equipped on the electric start model

NOTE:

Refer to "ENGINE FAILS TO START" for cold engine starting procedures.



5) Insert the knotted end of the emergency starter rope, into the notch in the flywheel rotor and wind the rope several turns clockwise.
6) Pull the rope slowly until resistance is felt.
7) Then, give a strong pull straight out to crank the engine. Repeat if necessary.

EMR21000

Engine Fails to Start

1) Put the engine in neutral. Open the throttle halfway (on models with neutral throttle-limiter, open throttle as far as it will go).
2) Start the engine.
3) If the engine still will not start, open and close the throttle two or three times. This will feed additional fuel to the accelerator pump of the carburetor. Then open the throttle halfway and start the engine.

11-6

SPECIFICATIONS

Item \ Model	Unit	T9.9MHX	T9.9EHX	T9.9ERX
DIMENSIONS				
• Overall Length	mm (in.)	993 (39.1)	993 (39.1)	575 (22.6)
• Overall Height S/L/X	mm (in.)	– / 1,178 (46.4) / 1,254 (49.4)	– / 1,178 (46.4) / 1,254 (49.4)	1,051 (41.4) / 1,178 (46.4) / 1,254 (49.4)
• Overall Width	mm (in.)	430 (16.9)	430 (16.9)	325 (12.8)
• Transom height S/L/X	mm (in.)	– / 559 (22.0) / 635 (25.0)	– / 559 (22.0) / 635 (25.0)	432 (17.0) / 559 (22.0) / 635 (25.0)
• Weight S/L/X	kg (lb.)	– / 44 (97) / 44 (97)	– / 45 (99) / 46 (101)	45 (99) / 46 (101) / 46 (101)
PERFORMANCE				
• Full throttle operating range	r/min	4,000~5,000	4,000~5,000	4,000~5,000
• Maximum output	kW (HP) @ r/min	7.3 (9.9) @ 4,500	7.3 (9.9) @ 4,500	7.3 (9.9) @ 4,500
• Idling speed	r/min	1,100~1,200	1,100~1,200	1,100~1,200
ENGINE				
• Type		4 stroke, OHC, L2	4 stroke, OHC, L2	4 stroke, OHC, L2
Displacement	cm^3 (cu.in.)	232 (14.16)	232 (14.16)	232 (14.16)
Bore × stroke	mm (in.)	59.0×42.4 (2.32×1.67)	59.0×42.4 (2.32×1.67)	59.0×42.4 (2.32×1.67)
• Valve clearance (cold engine) IN	mm (in.)	0.15~0.20 (0.006~0.008)	0.15~0.20 (0.006~0.008)	0.15~0.20 (0.006~0.008)
EX	mm (in.)	0.20~0.25 (0.008~0.010)	0.20~0.25 (0.008~0.010)	0.20~0.25 (0.008~0.010)
• Ignition system		C.D.I system	C.D.I system	C.D.I system
• Spark plug	NGK	CR6HS	CR6HS	CR6HS
Spark plug gap	mm (in.)	0.6~0.7 (0.024~0.028)	0.6~0.7 (0.024~0.028)	0.6~0.7 (0.024~0.028)
• Control system		Tiller control	Tiller control	Remote control
• Starting system		Manual start	Electric start	Electric start

EMR50104

SPECIFICATIONS

Item \ Model	Unit	T9.9MHX	T9.9EHX	T9.9ERX
DIMENSIONS				
• Overall Length	mm (in.)	993 (39.1)	993 (39.1)	575 (22.6)
• Overall Height S/L/X	mm (in.)	– / 1,178 (46.4) / 1,254 (49.4)	– / 1,178 (46.4) / 1,254 (49.4)	1,051 (41.4) / 1,178 (46.4) / 1,254 (49.4)
• Overall Width	mm (in.)	430 (16.9)	430 (16.9)	325 (12.8)
• Transom height S/L/X	mm (in.)	– / 559 (22.0) / 635 (25.0)	– / 559 (22.0) / 635 (25.0)	432 (17.0) / 559 (22.0) / 635 (25.0)
• Weight S/L/X	kg (lb.)	– / 44 (97) / 44 (97)	– / 45 (99) / 46 (101)	45 (99) / 46 (101) / 46 (101)
PERFORMANCE				
• Full throttle operating range	r/min	4,000~5,000	4,000~5,000	4,000~5,000
• Maximum output	kW (HP) @ r/min	7.3 (9.9) @ 4,500	7.3 (9.9) @ 4,500	7.3 (9.9) @ 4,500
• Idling speed	r/min	1,100~1,200	1,100~1,200	1,100~1,200
ENGINE				
• Type		4 stroke, OHC, L2	4 stroke, OHC, L2	4 stroke, OHC, L2
Displacement	cm^3 (cu.in.)	232 (14.16)	232 (14.16)	232 (14.16)
Bore × stroke	mm (in.)	59.0×42.4 (2.32×1.67)	59.0×42.4 (2.32×1.67)	59.0×42.4 (2.32×1.67)
• Valve clearance (cold engine) IN	mm (in.)	0.15~0.20 (0.006~0.008)	0.15~0.20 (0.006~0.008)	0.15~0.20 (0.006~0.008)
EX	mm (in.)	0.20~0.25 (0.008~0.010)	0.20~0.25 (0.008~0.010)	0.20~0.25 (0.008~0.010)
• Ignition system		C.D.I system	C.D.I system	C.D.I system
• Spark plug	NGK	CR6HS	CR6HS	CR6HS
Spark plug gap	mm (in.)	0.6~0.7 (0.024~0.028)	0.6~0.7 (0.024~0.028)	0.6~0.7 (0.024~0.028)
• Control system		Tiller control	Tiller control	Remote control
• Starting system		Manual start	Electric start	Electric start

12-1

Item \ Model	Unit	T9.9MHX	T9.9EHX	T9.9ERX
ENGINE				
• Battery capacity	V-AH (kc)	—	12-70 (252) ~ 100 (36.0)	12-70 (252) ~ 100 (360)
Minimum cold crank performance	Amps at –17.8°C (0°F)	—	380	380
Minimum reserve capacity	minutes at 26.7°C (80°F)	—	124	124
• Alternator output	V-Amp (W)	12-(120)	12-10	12-10
• Starting carburation system		Prime start system	Prime start system	Prime start system
DRIVE UNIT				
• Gear positions		Forward-Neutral-Reverse	Forward-Neutral-Reverse	Forward-Neutral-Reverse
Gear ratio		2.92 (13/18)	2.92 (13/18)	2.92 (13/18)
• Trim/tilt system		Manual	Manual	Manual
• Propeller mark		R	R	R
FUEL AND OIL				
• Fuel		Regular-unleaded gasoline (P.O.N.: minimum 86)	Regular-unleaded gasoline (P.O.N.: minimum 86)	Regular-unleaded gasoline (P.O.N.: minimum 86)
Fuel tank capacity	L (US gal, Imp gal)	—	—	—
• Recommended engine oil		4 stroke motor oil	4 stroke motor oil	4 stroke motor oil
	SAE	10W-30, 10W-40, 20W-40	10W-30, 10W-40, 20W-40	10W-30, 10W-40, 20W-40
	API	SE, SF, SG	SE, SF, SG	SE, SF, SG
Engine oil capacity	L (US qt, Imp qt)	1.0 (1.06, 0.88)	1.0 (1.06, 0.88)	1.0 (1.06, 0.88)
• Recommended gearcase oil		Hypoid gear oil (SAE 90)	Hypoid gear oil (SAE 90)	Hypoid gear oil (SAE 90)
Gear oil capacity	cm³ (US oz, Imp oz)	320 (10.82, 11.29)	320 (10.82, 11.29)	320 (10.82, 11.29)
TIGHTENING TORQUE				
• Spark plug	Nm (m • kg, ft • lb)	13 (1.3, 9.4)	13 (1.3, 9.4)	13 (1.3, 9.4)
• Propeller nut	Nm (m • kg, ft • lb)	21 (2.1, 15)	21 (2.1, 15)	21 (2.1, 15)
• Engine oil drain plug	Nm (m • kg, ft • lb)	8 (0.8, 5.8)	8 (0.8, 5.8)	8 (0.8, 5.8)
• Engine oil filter	Nm (m • kg, ft • lb)	8 (0.8, 5.8)	8 (0.8, 5.8)	8 (0.8, 5.8)

Item \ Model	Unit	T9.9MHX	T9.9EHX	T9.9ERX
ENGINE				
• Battery capacity	V-AH (kc)	—	12-70 (252) ~ 100 (36.0)	12-70 (252) ~ 100 (360)
Minimum cold crank performance	Amps at –17.8°C (0°F)	—	380	380
Minimum reserve capacity	minutes at 26.7°C (80°F)	—	124	124
• Alternator output	V-Amp (W)	12-(120)	12-10	12-10
• Starting carburation system		Prime start system	Prime start system	Prime start system
DRIVE UNIT				
• Gear positions		Forward-Neutral-Reverse	Forward-Neutral-Reverse	Forward-Neutral-Reverse
Gear ratio		2.92 (13/18)	2.92 (13/18)	2.92 (13/18)
• Trim/tilt system		Manual	Manual	Manual
• Propeller mark		R	R	R
FUEL AND OIL				
• Fuel		Regular-unleaded gasoline (P.O.N.: minimum 86)	Regular-unleaded gasoline (P.O.N.: minimum 86)	Regular-unleaded gasoline (P.O.N.: minimum 86)
Fuel tank capacity	L (US gal, Imp gal)	—	—	—
• Recommended engine oil		4 stroke motor oil	4 stroke motor oil	4 stroke motor oil
	SAE	10W-30, 10W-40, 20W-40	10W-30, 10W-40, 20W-40	10W-30, 10W-40, 20W-40
	API	SE, SF, SG	SE, SF, SG	SE, SF, SG
Engine oil capacity	L (US qt, Imp qt)	1.0 (1.06, 0.88)	1.0 (1.06, 0.88)	1.0 (1.06, 0.88)
• Recommended gearcase oil		Hypoid gear oil (SAE 90)	Hypoid gear oil (SAE 90)	Hypoid gear oil (SAE 90)
Gear oil capacity	cm³ (US oz, Imp oz)	320 (10.82, 11.29)	320 (10.82, 11.29)	320 (10.82, 11.29)
TIGHTENING TORQUE				
• Spark plug	Nm (m • kg, ft • lb)	13 (1.3, 9.4)	13 (1.3, 9.4)	13 (1.3, 9.4)
• Propeller nut	Nm (m • kg, ft • lb)	21 (2.1, 15)	21 (2.1, 15)	21 (2.1, 15)
• Engine oil drain plug	Nm (m • kg, ft • lb)	8 (0.8, 5.8)	8 (0.8, 5.8)	8 (0.8, 5.8)
• Engine oil filter	Nm (m • kg, ft • lb)	8 (0.8, 5.8)	8 (0.8, 5.8)	8 (0.8, 5.8)

SPECIFICATIONS

Item \ Model	Unit	F9.9MHX	F9.9ERX	—
DIMENSIONS				
• Overall Length	mm (in.)	863 (34.0)	575 (22.6)	
• Overall Height S/L	mm (in.)	1,004 (39.5) / 1,131 (44.5)	1,004 (39.5) / 1,131 (44.5)	
• Overall Width	mm (in.)	392 (15.4)	325 (12.8)	
• Transom height S/L	mm (in.)	432 (17.0) / 559 (22.0)	432 (17.0) / 559 (22.0)	
• Weight S/L	kg (lb.)	42 (93) / 43 (95)	44 (97) / 45 (99)	
PERFORMANCE				
• Full throttle operating range	r/min	4,500~5,500	4,500~5,500	
• Maximum output	kW (HP) @ r/min	7.3 (9.9) @ 5,000	7.3 (9.9) @ 5,000	
• Idling speed	r/min	900~1,000	900~1,000	
ENGINE				
• Type		4 stroke, OHC, L2	4 stroke, OHC, L2	
Displacement	cm^3 (cu.in.)	232 (14.16)	232 (14.16)	
Bore × stroke	mm (in.)	59.0×42.4 (2.32×1.67)	59.0×42.4 (2.32×1.67)	
• Valve clearance (cold engine) IN	mm (in.)	0.15~0.20 (0.006~0.008)	0.15~0.20 (0.006~0.008)	
EX	mm (in.)	0.20~0.25 (0.008~0.010)	0.20~0.25 (0.008~0.010)	
• Ignition system		C.D.I system	C.D.I system	
• Spark plug	NGK	CR6HS	CR6HS	
Spark plug gap	mm (in.)	0.6~0.7 (0.024~0.028)	0.6~0.7 (0.024~0.028)	
• Control system		Tiller control	Remote control	
• Starting system		Manual start	Electric start	

SPECIFICATIONS

Item \ Model	Unit	F9.9MHX	F9.9ERX	—
DIMENSIONS				
• Overall Length	mm (in.)	863 (34.0)	575 (22.6)	
• Overall Height S/L	mm (in.)	1,004 (39.5) / 1,131 (44.5)	1,004 (39.5) / 1,131 (44.5)	
• Overall Width	mm (in.)	392 (15.4)	325 (12.8)	
• Transom height S/L	mm (in.)	432 (17.0) / 559 (22.0)	432 (17.0) / 559 (22.0)	
• Weight S/L	kg (lb.)	42 (93) / 43 (95)	44 (97) / 45 (99)	
PERFORMANCE				
• Full throttle operating range	r/min	4,500~5,500	4,500~5,500	
• Maximum output	kW (HP) @ r/min	7.3 (9.9) @ 5,000	7.3 (9.9) @ 5,000	
• Idling speed	r/min	900~1,000	900~1,000	
ENGINE				
• Type		4 stroke, OHC, L2	4 stroke, OHC, L2	
Displacement	cm^3 (cu.in.)	232 (14.16)	232 (14.16)	
Bore × stroke	mm (in.)	59.0×42.4 (2.32×1.67)	59.0×42.4 (2.32×1.67)	
• Valve clearance (cold engine) IN	mm (in.)	0.15~0.20 (0.006~0.008)	0.15~0.20 (0.006~0.008)	
EX	mm (in.)	0.20~0.25 (0.008~0.010)	0.20~0.25 (0.008~0.010)	
• Ignition system		C.D.I system	C.D.I system	
• Spark plug	NGK	CR6HS	CR6HS	
Spark plug gap	mm (in.)	0.6~0.7 (0.024~0.028)	0.6~0.7 (0.024~0.028)	
• Control system		Tiller control	Remote control	
• Starting system		Manual start	Electric start	

Item \ Model	Unit	F9.9MHX	F9.9ERX	—
ENGINE				
• Batterycapacity	V-AH (kc)	—	12-70 (252) ~ 100 (360)	
Minimum cold crank performance	Amps at −17.8°C (0°F)	—	380	
Minimum reserve capacity	minutes at 26.7°C (80°F)	—	124	
• Alternator output	V-Amp (W)	12-(80)	12-6	
• Starting carburation system		Prime start system	Prime start system	
DRIVE UNIT				
• Gear positions		Forward-Neutral-Reverse	Forward-Neutral-Reverse	
Gear ratio		2.08 (13/27)	2.08 (13/27)	
• Trim/tilt system		Manual	Manual	
• Propeller mark		J	J	
FUEL AND OIL				
• Fuel		Regular-unleaded gasoline (P.O.N.: minimum 86)	Regular-unleaded gasoline (P.O.N.: minimum 86)	
Fuel tank capacity	L (US gal, Imp gal)	—	—	
• Recommended engine oil		4 stroke motor oil	4 stroke motor oil	
	SAE	10W-30, 10W-40, 20W-40	10W-30, 10W-40, 20W-40	
	API	SE, SF, SG	SE, SF, SG	
Engine oil capacity	L (US qt, Imp qt)	1.0 (1.06, 0.88)	1.0 (1.06, 0.88)	
• Recommended gearcase oil		Hypoid gear oil (SAE 90)	Hypoid gear oil (SAE 90)	
Gear oil capacity	cm³ (US oz, Imp oz)	185 (6.25, 6.52)	185 (6.25, 6.52)	
TIGHTENING TORQUE				
• Spark plug	Nm (m • kg, ft • lb)	13 (1.3, 9.4)	13 (1.3, 9.4)	
• Propeller nut	Nm (m • kg, ft • lb)	21 (2.1, 15)	21 (2.1, 15)	
• Engine oil drain plug	Nm (m • kg, ft • lb)	8 (0.8, 5.8)	8 (0.8, 5.8)	
• Engine oil filter	Nm (m • kg, ft • lb)	8 (0.8, 5.8)	8 (0.8, 5.8)	

Item \ Model	Unit	F9.9MHX	F9.9ERX	—
ENGINE				
• Batterycapacity	V-AH (kc)	—	12-70 (252) ~ 100 (360)	
Minimum cold crank performance	Amps at −17.8°C (0°F)	—	380	
Minimum reserve capacity	minutes at 26.7°C (80°F)	—	124	
• Alternator output	V-Amp (W)	12-(80)	12-6	
• Starting carburation system		Prime start system	Prime start system	
DRIVE UNIT				
• Gear positions		Forward-Neutral-Reverse	Forward-Neutral-Reverse	
Gear ratio		2.08 (13/27)	2.08 (13/27)	
• Trim/tilt system		Manual	Manual	
• Propeller mark		J	J	
FUEL AND OIL				
• Fuel		Regular-unleaded gasoline (P.O.N.: minimum 86)	Regular-unleaded gasoline (P.O.N.: minimum 86)	
Fuel tank capacity	L (US gal, Imp gal)	—	—	
• Recommended engine oil		4 stroke motor oil	4 stroke motor oil	
	SAE	10W-30, 10W-40, 20W-40	10W-30, 10W-40, 20W-40	
	API	SE, SF, SG	SE, SF, SG	
Engine oil capacity	L (US qt, Imp qt)	1.0 (1.06, 0.88)	1.0 (1.06, 0.88)	
• Recommended gearcase oil		Hypoid gear oil (SAE 90)	Hypoid gear oil (SAE 90)	
Gear oil capacity	cm³ (US oz, Imp oz)	185 (6.25, 6.52)	185 (6.25, 6.52)	
TIGHTENING TORQUE				
• Spark plug	Nm (m • kg, ft • lb)	13 (1.3, 9.4)	13 (1.3, 9.4)	
• Propeller nut	Nm (m • kg, ft • lb)	21 (2.1, 15)	21 (2.1, 15)	
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• Engine oil filter	Nm (m • kg, ft • lb)	8 (0.8, 5.8)	8 (0.8, 5.8)	

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